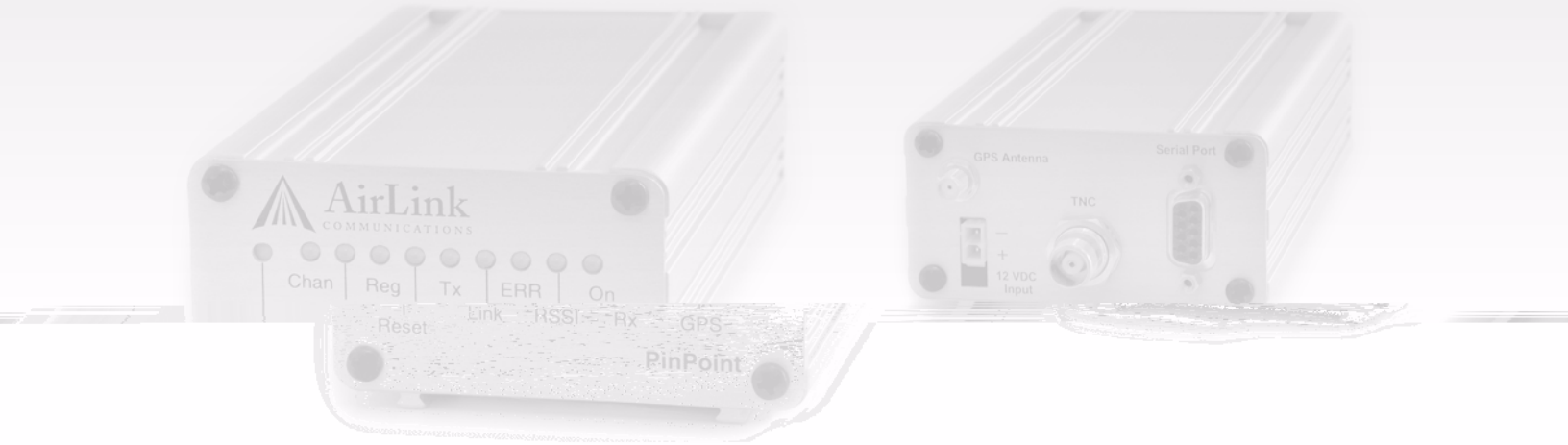
AirLink
COMMUNICATIONS

EDGE/G

User Guide







Version 2.32 - April 2007

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WARNING

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Important Notice

Because of the nature of wireless communications, transmission and reception of data can never be guaranteed. Data may be delayed, corrupted (i.e., have errors) or be totally lost. Although significant delays or losses of data are rare when wireless devices such as the AirLink Communications modem are used in a normal manner with a well-constructed network, the AirLink modem should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death, or loss of property. AirLink Communications, Inc., accepts no responsibility for damages of any kind resulting from delays or errors in data transmitted or received using the AirLink Communications modem, or for failure of the AirLink Communications modem to transmit or receive such data.

Safety and Hazards

Do not operate the AirLink Communications modem in areas where blasting is in progress, where explosive atmospheres may be present, near medical equipment, near life support equipment, or any equipment which may be susceptible to any form of radio interference. In such areas, the AirLink Communications modem MUST BE POWERED OFF. The AirLink Communications modem can transmit signals that could interfere with this equipment. Do not operate the AirLink Communications modem in any aircraft, whether the aircraft is on the ground or in flight. In aircraft, the AirLink Communications modem MUST BE POWERED OFF. When operating, the AirLink Communications modem can transmit signals that could interfere with various on board systems. The driver or operator of any vehicle should not operate the AirLink Communications modem while in control of a vehicle. Doing so will detract from the driver or operator's control and operation of that vehicle. In some states and provinces, operating such communications devices while in control of a vehicle is an offence.

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Warranty Summary

For the full and complete text, refer to the warranty appendix in the modem user guide or to the AirLink website (http://www.airlink.com) for the full text of the warranty.

Software: Software is warrantied for 90 days to work in substantial conformance to applicable software specifications. AirLink's sole obligation is to, at their option, refund the liscense fee or replace the software with other software.

Hardware: All equipment is warrantied for one year after delivery to conform with AirLink's specifications and be free from manufacturing defect. Optional warranty extensions can be purchased for two and four years which would increase the warranty period to three and five years respectively. If under normal use, the hardware proves to have any such defect and the Customer notifies AirLink of such defect within the warranty period, AirLink, at its option, will either repair or replace the same without charge but only upon written authorization and in accordance with instructions of AirLink using a Return Material Authorization ("RMA") process (details of the process are in the full warranty statement).

THIS WARRANTY DOES NOT COVER PRODUCTS THAT DO NOT CONFORM TO SPECIFICATIONS BECAUSE OF ACCIDENT, ALTERATIONS, FAILURE TO FOLLOW INSTRUCTIONS, USE OUTSIDE THE SCOPE OF ANY OTHER PROVIDED DOCUMENTATION (E.G., USER GUIDE, INSTALLATION GUIDE, QUICK START GUIDE), MISUSE, ABUSE, NEGLECT, FIRE, FLOOD OR ACTS OF GOD.

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CHA E 1 l d EDGE/G

The PinPoint's rugged form factor is ideal for industrial and commercial applications that require real-time communications. The PinPoint provides cellular data communications for a variety of applications, such as public safety, traffic control, traffic metering, transit arrival systems, and more.

FIGURE 1. PinPoint front and back



EDGE/GPRS Overview

EDGE (Enhanced Data rates for GSM Evolution) provides end-to-end packet data services with an enhanced connectivity building on GPRS technology and using the established GSM networks. EDGE provides higher transmission rates and better transmission quality for data than GPRS. EDGE can carry data at speeds typically up to 384 kbit/s in packet mode.

When EDGE/GPRS is not available, your PinPoint will fall-back to GPRS for the connection to Your Wireless Service Provider to provide continued connectivity.

General Packet Radio Service (GPRS) is packet-switched with many users sharing the same transmission channel, but only transmitting when they have data to send. This means that the total available bandwidth can be immediately dedicated to those users who are actually sending at any given moment, providing higher utilization where users only send or receive data intermittently. GPRS provides speeds of 30–70 kbps with bursts up to 170 kbps.

Establishing an Internet Connection

The PinPoint uses Your Wireless Service Provider as an ISP (Internet Service Provider) to connect you to the Internet.

Steps of a connection:

1. When your PinPoint is powered on, it automatically searches for cellular service using EDGE/GPRS.
2. Your PinPoint establishes a PPP (Point to Point Protocol or "dial" up connection) link to Your Wireless Service Provider's network, also called registering on the network, and receives an IP address.
3. When your PinPoint has received its IP address from Your Wireless Service Provider, then it is ready to allow you to connect to the Internet.

FIGURE 2. Using the PinPoint to connect to the Internet

Dynamic vs. Static IP Addresses

As stated above, when your PinPoint registers on Your Wireless Service Provider's network, it receives an IP address. There are two types of addresses on networks: dynamic and static.

- Dynamic addresses are assigned on a "need to have" basis. Your PinPoint might not always receive the same address each time it connects with Your Wireless Service Provider.
- Static addresses are permanently assigned to a particular account and will always be used whenever your PinPoint connects to the Internet. The IP address will not be given to anyone else.

Most ISPs (cellular included) use dynamic IP addresses rather than static IP addresses since it allows them to reuse a smaller number of IP addresses for a large number of customers. A dynamic IP address is suitable for many common Internet uses, such as web browsing, looking up data on another computer system, or other client functions (such as data only being sent out or only being received after an initial request).

If you need to contact your PinPoint, a device connected to the modem, or a host system using the modem from the Internet, you need to have a known IP (such as one which is static) or domain name (an IP address which is converted by a DNS server into a word based name). If you have a dynamic IP address for your modem, you can use a Dynamic DNS service (such as IP Manager, page 14) to translate your IP address into to a domain name.

Caution: If you want to connect remotely to your PinPoint using TCP/IP, the IP address given to your modem by the network cannot be a private or internal IP address (such as a) unless you are on the same network or inside that network's firewall (such as with frame relay).

Using Your PinPoint to Connect to the Internet

In Public Mode, your PinPoint will pass the IP address from Your Wireless Service Provider's network to your device or computer. In Private Mode, your modem will assign configured, static local network IP addresses for the modem and your device.

The modem will perform a **one-to-one** routing for all internet traffic to and from the computer or other end device.

If you need to have more than one device connected to the Internet through the modem, you will need to have a router connected to the modem. The modem would provide the one-to-one connection to the router with the router configured to provide a broader NAT service to the other devices connected to it.

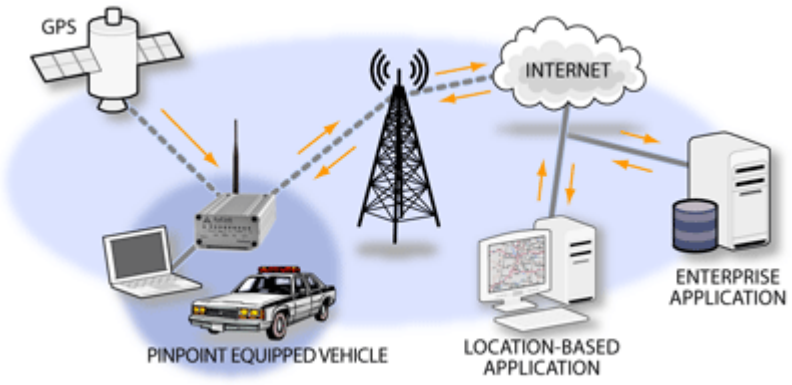
To use your PinPoint's serial port to connect to the Internet from your computer, you need to connect the computer directly to the PinPoint's serial port with a straight-through serial cable and use Dial-Up Networking (DUN).

Common Uses for the PinPoint

The PinPoint's rugged construction and cellular connection make it ideal for use in remote and/or industrial locations.

Because of its GPS capabilities, the PinPoint is ideal for vehicle tracking and other situations where mapping a moving object is as important as connecting to a network.

FIGURE 3. Vehicle Tracking and Mobile Internet Access



CHA E 2 A

To install the SIM, you will only need a small phillips head screw driver.

1. Opening the Case

a. Unplug the PinPoint's power and all cables.

b. Using a small phillips head screw driver, remove the screws on the back of the PinPoint.

c. Slide the casing off of the PinPoint and set it aside.

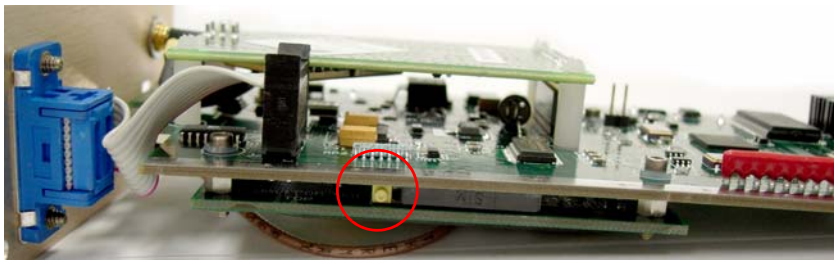
FIGURE 1. PinPoint back



2. Ejecting the SIM tray

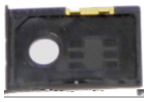
a. Using the tip of a PDA stylus, an unbent paperclip, or other slim *blunt* item press the yellow button of the SIM tray. On the PinPoint, the button is between two boards.

FIGURE 2. Tray button: PinPoint



b. Slide the tray out of the slot.

FIGURE 3. Empty SIM Tray



3. Inserting the SIM

a. Place the SIM into the tray and gently press to click it into place.

FIGURE 4. SIM Tray with a SIM



The SIM may be a different color than this example.

b. Slide the tray back into the modem and gently press to click it into place.

Note: The top of the card faces the the bottom of the modem.

FIGURE 5. **Inserting the SIM: PinPoint**



4. Finishing the SIM installation

a. Slide the PinPoint back into the case.

b. Secure the back of the PinPoint with the screws.

Setting the APN with Wireless Ace

The APN (Access Point Name) is the way your modem knows how it will be communicating with the network. The APN allows custom IP addressing and tailoring your company's wireless IP solution to meet the security and IP addressing requirements of your applications.

Most EDGE/GPRS accounts use the default addressing solution of Private or Public IP addresses supplied by the Internet and Proxy APNs. Only if you have a Static or Custom IP address should you need to configure a custom APNs.

1. Power on your PinPoint and connect directly to the serial port on your computer.

2. Start **Wireless Ace** and connect to your modem:

Start > All Programs > AirLink Communications > Wireless Ace 3G > Wireless Ace 3G

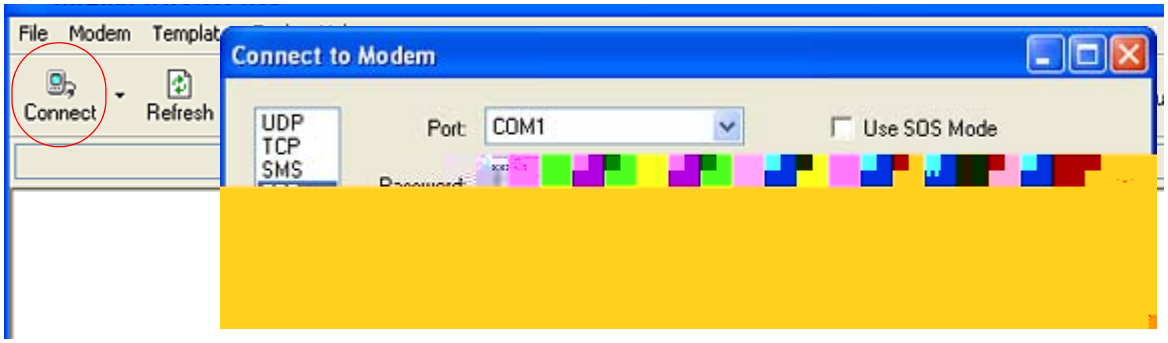
A. Click on **Connect**.

B. Select **PPP**.

C. Select the COM port to which the modem is connected on your computer (commonly ***COM1***).

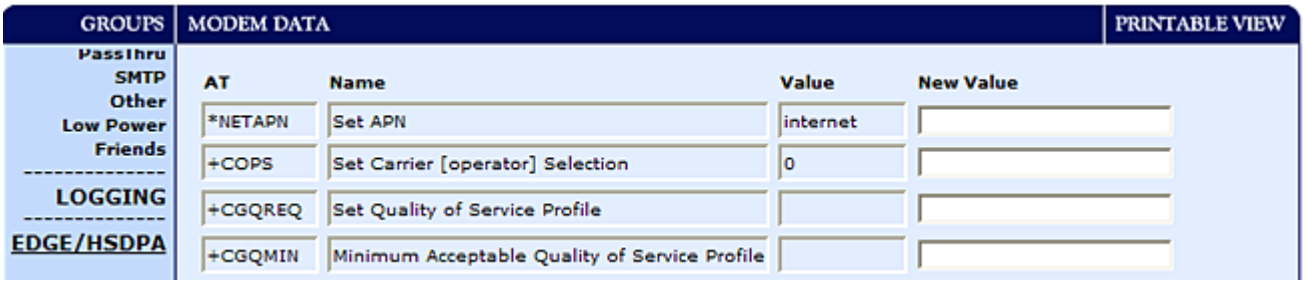
D. Type in the modem's password (default ***12345***).

FIGURE 6. **Wireless Ace: Connect**



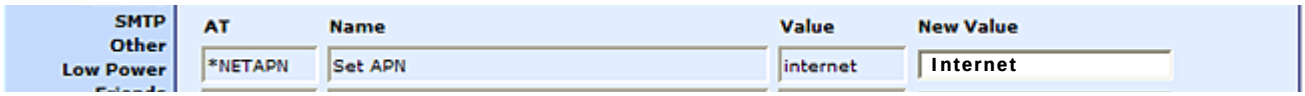
3. Select **EDGE/HSDPA** from the menu on the left side of Wireless Ace (under "Groups").

FIGURE 7. **Wireless Ace: EDGE/HSDPA**



4. Type in the APN in the new value field of ***NETAPN**.

FIGURE 8. **Wireless Ace: *NETAPN**



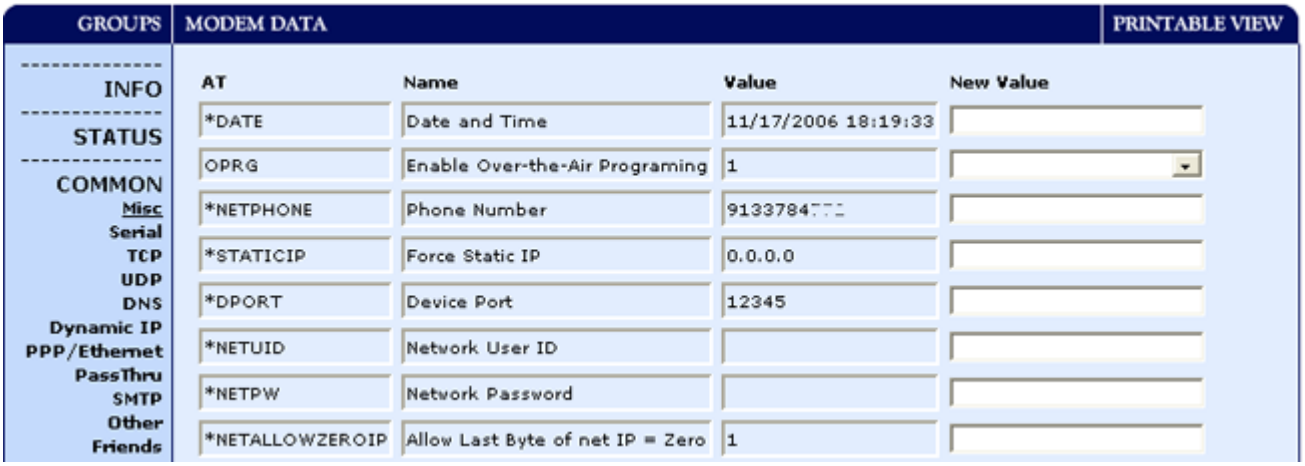
For most EDGE/GPRS accounts the APN for your modem will be **Internet** or **Proxy**. Consult with your account representative on which APN to use.

Optional

If you need to configure your modem for a custom APN, after entering the APN, there is additional information you will need to enter.

A. Select **Misc** from the menu on the left side under the Common group.

FIGURE 9. Wireless Ace: Common - Misc

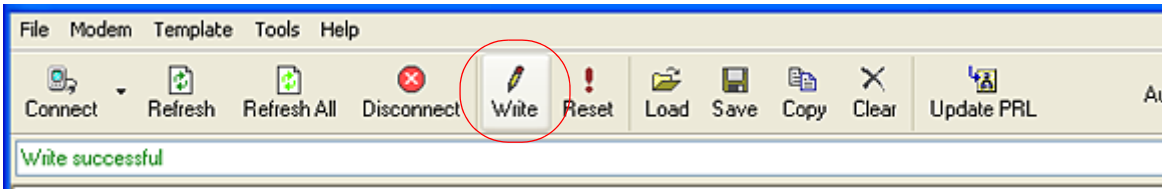


B. Enter the **NAI** into the new value field for ***NETUID** and enter your **network password** into the new value field for ***NETPW**.

FIGURE 10. Wireless Ace: Common - Misc

5. When you have finished entering the APN settings, click the **Write** button on the tool bar of Wireless Ace and wait for the message “Write Successful” to appear in the status bar.

FIGURE 11. Wireless Ace: Write



6. It is recommended that you reset your modem after configuring the APN. Either click the **Reset** button in Wireless Ace o-(o)4.9D0ess the reset button on the modem.

CHA E 3

AirLink offers a suite of utilities to optimize your PinPoint's performance, allowing you to remotely view status and make changes to the configuration as needed.

- AceView
- Wireless Ace
- AceNet
- Modem Doctor

This section of the PinPoint User Guide covers basic information about these utilities. For additional information on a specific application and how to use it, please refer to the user guide for the specific utility.

AirLink modem utilities, except AceNet, are free of charge to those who own AirLink modems. You can download the applications and their user guides from the AirLink web site: http://www.airlink.com/support. Contact your dealer or AirLink representative for information on AceNet.

Note: AceView, Wireless Ace, and AceNet require the Microsoft .NET Framework v. 1.1 and Microsoft Windows 98, Windows 2000, Windows XP, or later. You can obtain the Microsoft .NET Framework from Microsoft at: http://www.microsoft.com/.

AceView

AceView is a low-profile monitoring tool to view the status of your AirLink PinPoint and display network status, IP address, RSSI strength, and other basic connection information.

FIGURE 1. AceView



You can connect to your PinPoint locally using a DUN connection or Ethernet across a LAN or connected directly with a cross over cable. The display is dynamically updated with the current status of the modem.

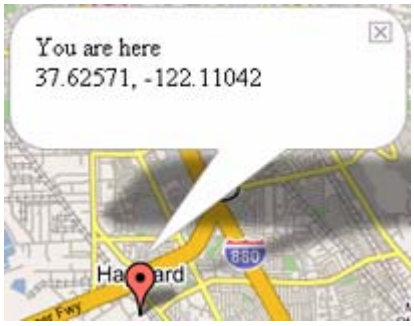
The GPS features are available only for PinPoint X, PinPoint-E, and PinPoint modems.

When you use DUN to connect to your PinPoint, AceView can monitor and maintain the DUN connection.

The DUN connection features are not available with Windows NT or Windows 98. Refer to the AceView Guide for information on how to connect using serial for Windows NT or Windows 98.

AceView also features a link to a web-based mapping service so you can see where the GPS coordinates locate the PinPoint.

FIGURE 2. Map Coordinates



Note: The mapping feature requires an Internet connection.

Wireless Ace

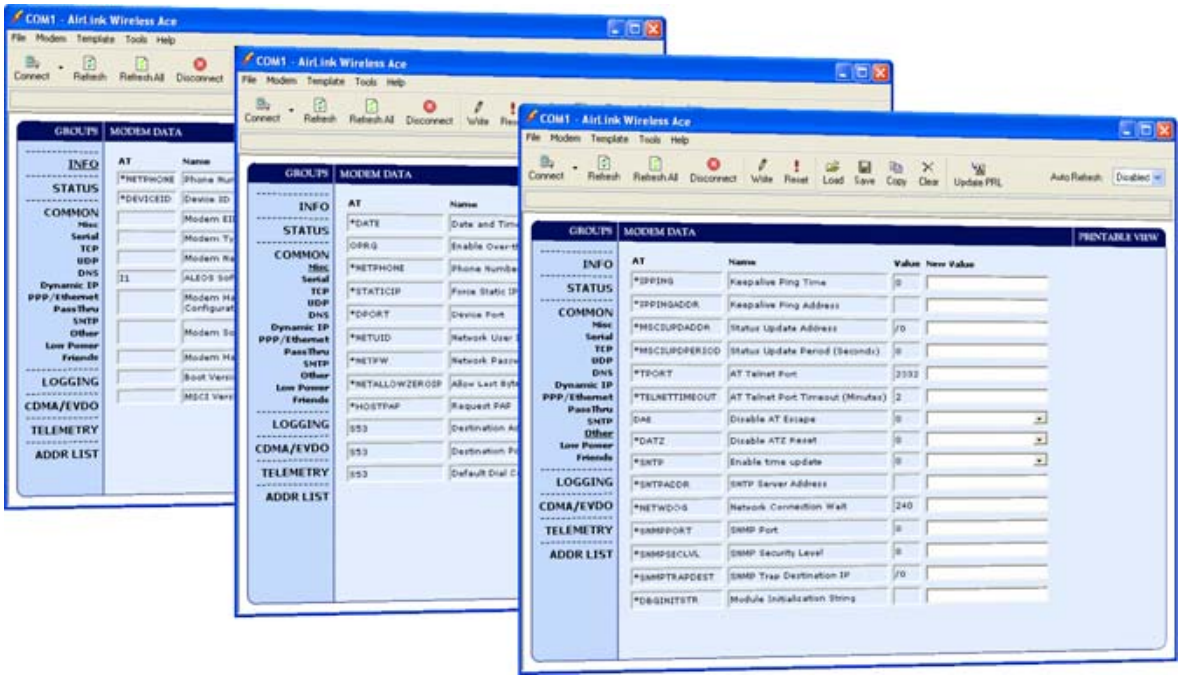
Wireless Ace enables modems equipped with ALEOS to be monitored and configured locally or remotely.

As long as your PinPoint is online and publicly accessible, support personnel can access your modem from anywhere at any time to see how it is operating and how it is configured. Parameter changes can be made instantly over-the-air.

Once your modem is configured and installed correctly, a template can be made to program other modems with the same parameter values. This enables quick, accurate deployment of large pools of modems.

Most configuration screen shots in this guide are using Wireless Ace. Connecting to the modem using Wireless Ace is covered in the “AT Commands” chapter on page 59.

FIGURE 3. Wireless Ace



AceNet

AceNet is a full featured application that you can use to monitor several AirLink modems at the same time, use a template from Wireless Ace to change the configuration in all of them simultaneously, keep the modems up-to-date with the latest firmware by updating them over the air, periodically log the modems' Status parameters, and even graphically chart the logged parameters to see trends or other over time information.

AceNet's remote connections use TCP/IP, UDP, or SMS.

AceNet is a separate product which can be purchased from AirLink. Contact your AirLink representative for more information.

FIGURE 4. AceNet

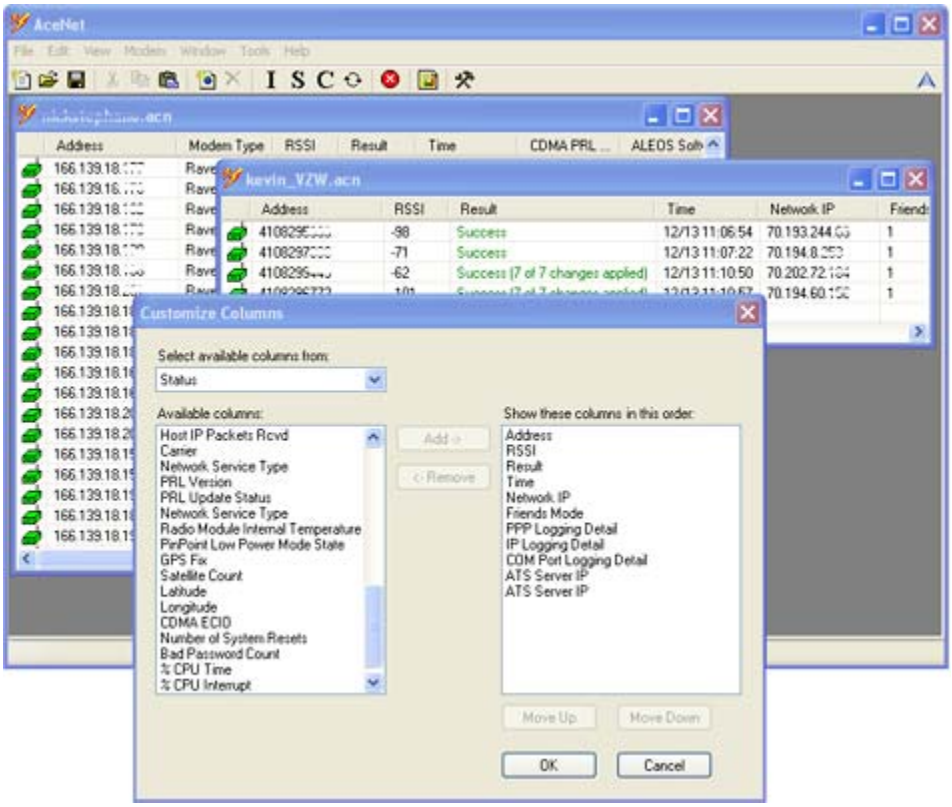
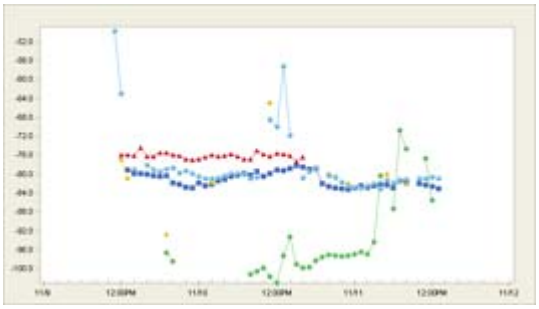


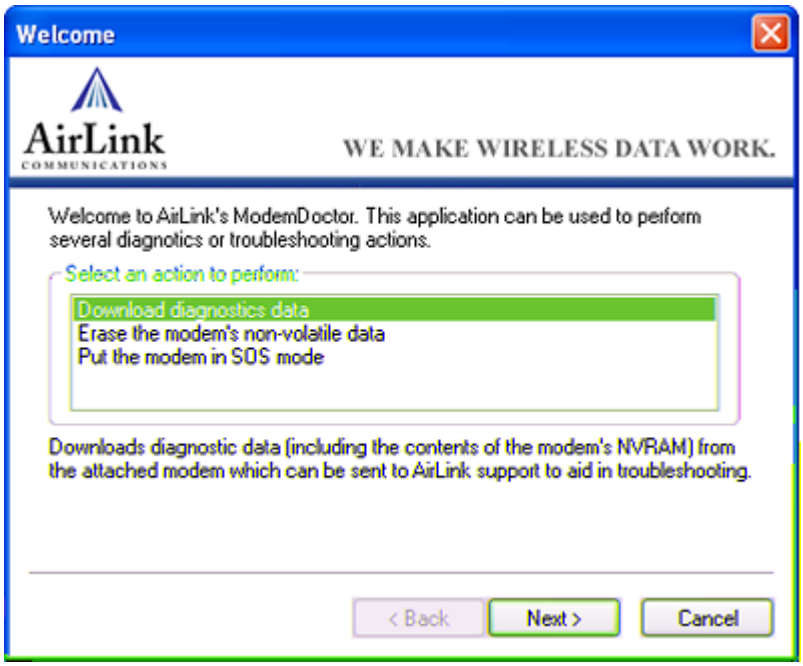
FIGURE 5. AceNet Charting



Modem Doctor

Modem Doctor is a troubleshooting and diagnostics utility. This utility will allow you to get a log file of the PinPoint activity which you can then send to AirLink support, erase the current configuration completely, and temporarily set the PinPoint to a known configuration to aid in trouble shooting (SOS mode).

FIGURE 6. **Modem Doctor**



CHA E 4 I M d DN

If you have a fleet of AirLink modems or even if you only have one, it can be difficult to keep track of the current IP addresses, especially if the addresses aren't static but change every time the modems connect to Your Wireless Service Provider. If you need to connect to a modem, or the device behind it, it is so much easier when you have a domain name (car54.mydomain.com, where are you?).

Reasons to contact the modem and/or the connected device:

- Requesting a location update from a delivery truck.
- Contacting a surveillance camera to download logs or survey a specific area.
- Updating advertisements to be displayed in a cab.
- Monitoring and troubleshooting the status of the modem itself without needing to bring it in or go out to it.

A dynamic IP address is suitable for many Internet activities such as web browsing, looking up data on another computer system, data only being sent out, or data only being received after an initial request (also called Mobile Originated). However, if you need to contact your PinPoint directly, a device connected to the modem, or a host system using your PinPoint (also called Mobile Terminated), a dynamic IP won't give you a reliable address to contact (since it may have changed since the last time it was assigned).

Domain names are often only connected to static IP addresses because of the way most domain name (DNS) servers are set-up. Dynamic DNS servers require notification of IP Address changes so they can update their DNS records and link a dynamic IP address to the correct name.

- Dynamic IP addresses are granted only when your PinPoint is connected and can change each time the modem reconnects to the network.
- Static IP addresses are granted the same address every time your PinPoint is connected and are not in use when your PinPoint is not connected.

Since many cellular providers, like wire-based ISPs, do not offer static IP addresses or static address accounts cost a premium vs. dynamic accounts, AirLink developed IP Manager to work with a Dynamic DNS server to receive notification from AirLink modems to translate the modem's dynamic IP address to a fully qualified domain name. Thus, you can contact your PinPoint directly from the Internet using a domain name.

Fully Qualified Domain Name

A domain name is a name of a server or device on the Internet which is associated with an IP address. Similar to how the street address of your house is one way to contact you and your phone number is another, both the IP address and the domain name can be used to contact a server or device on the Internet. While contacting you at your house address or with your phone number employ different methods, using a domain name instead of the IP address actually uses the same method, just a word based name is commonly easier to remember for most people than a string of numbers.

Understanding the parts of a domain name can help to understand how IP Manager works and what you need to be able to configure the modem. A fully qualified domain name (FQDN) generally has several parts.

- **Top Level Domain (TLD):** The TLD is the ending suffix for a domain name (.com, .net, .org, etc.)
- **Country Code Top Level Domain (ccTLD):** This suffix is often used after the TLD for most countries *except the US* (.ca, .uk, .au, etc.)
- **Domain name:** This is the name registered with ICANN (Internet Corporation for Assigned Names and Numbers) or the registry for a the country of the ccTLD (i.e. if a domain is part of the .ca TLD, it would be registered with the Canadian domain registry). It is necessary to have a name registered before it can be used.
- **Sub-domain or server name:** A domain name can have many sub-domain or server names associated with it. Sub-domains need to be registered with the domain, but do not need to be registered with ICANN or any other registry. It is the responsibility of a domain to keep track of its own subs.

car54.mydomain.com

- **.com** is the TLD
- **mydomain** is the domain (usually noted as mydomain.com since the domain is specific to the TLD)
- **car54** is the subdomain or server name associated with the device, computer, or modem registered with mydomain.com

car54.mydomain.com.ca

This would be the same as above, but with the addition of the country code. In this example, the country code (.ca) is for Canada.



A URL (Universal Resource Locator) is different from a domain name in that it also indicates information on the protocol used by a web browser to contact that address, such as http://www.airlink.com. www.airlink.com is a fully qualified domain name, but the http://, the protocol identifier, is what makes the whole thing a URL.

Dynamic Names

When an IP address is not expected to change, the DNS server can indicate to all queries that the address can be cached and not looked up for a long period of time. Dynamic DNS servers, conversely, have a short caching period for the domain information to prevent other Internet sites or queries from using the old information. Since the IP address of a modem with a dynamic account can change frequently, if the old information was used (such as with a DNS server which indicates the address can be cached for a long period of time) when the IP address changed, the domain would no longer point to the new and correct IP address of the modem.

If your PinPoint is configured for Dynamic IP, when it first connects to the Internet, it sends a IP change notification to IP Manager. IP Manger will acknowledge the change and update the Dynamic DNS server. The new IP address will then be the address for your PinPoint's configured name.

Once your PinPoint's IP address has been updated in IP Manager, it can be contacted via name. If the IP address is needed, you can use the domain name to determine the IP address.

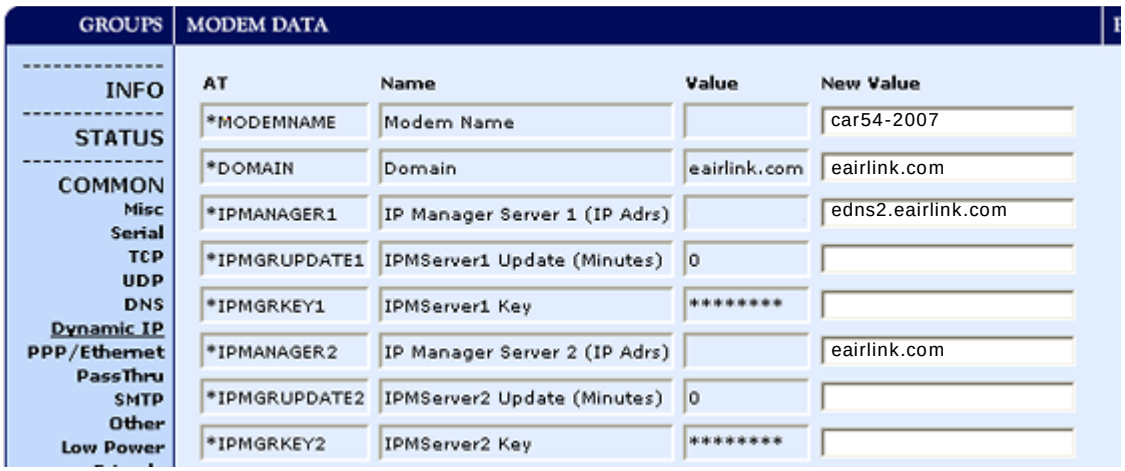
Note: The fully qualified domain name of your PinPoint will be a subdomain of the domain used by the IP Manager server.

Configuring the PinPoint for IP Manager and a Dynamic IP Domain Name

To configure the Dynamic IP settings in your PinPoint so that it will use IP Manager, you can use Wireless Ace or a terminal application to enter the commands (page 59).

To configure your AirLink modem to be addressed by name, the modem needs to have 4 elements configured. You can configure a second dynamic server as a backup, secondary, or alternate server. In Wireless Ace, select **Dynamic IP**.

FIGURE 1. Wireless Ace: Dynamic IP



***MODEMNAME:** The name you want for the modem.

***DOMAIN:** The domain name to be used by the modem.

***IPMANAGER1** and ***IPMANAGER2:** The IP address or domain name of the dynamic DNS server which is running IP Manager.



Note: To use the name here instead of the IP, you need to have DNS set up in your PinPoint (page 18).

***IPMGRUPDATE1** and ***IPMGRUPDATE2:** How often, in minutes, you want the address sent to IP Manager. If this is set to zero, the modem will only send an update if the IP address changes (example, if your PinPoint modem is reset or is assigned a different IP address).

***IPMGRKEY1** and ***IPMGRKEY2**: User defined password key which is used instead of AirLink secret key when using an IP Manager server other than the one provided by AirLink.

Restrictions for Modem Name

For the Modem Name, you should use something which is unique but also easy to remember. Your company name or the intended function of the modem are recommended. If you have more than one modem and want to name them the same, you can append a number for each. Since it is an Internet domain name, there are some restrictions for the name.

- Must begin with a letter or number
- Can include a hyphen (-)
- Cannot contain spaces
- Must be no longer than 20 characters total

Data Usage for IP Manager Server Updates

The IP Manager update is a small packet sent to the server with a response sent back to the modem. If you have ***IPMGRUPDATE1** or ***IPMGRUPDATE2** set to any number but zero, the modem will send the update not only when it receives a new IP address but at the time interval as well. The data traffic could be billed by your carrier.

Each update is a total of 68 bytes from the modem with a 50 byte total response from the server for a round trip update of 118 bytes.

Eairlink.com

As a service, Airlink maintains a IP Manager servers which can be used for any AirLink modem.

- *DOMAIN: eairlink.com
- *IPMANAGER1 : edns2.eairlink.com
- *IPMANAGER2 : eairlink.com

Note: The IP Manager service from AirLink is currently not a guaranteed service though every effort is made to keep it operational 24/7.
When using AirLink's IP Manager servers, since there are many AirLink modems using the service, it is even more imperative to have a unique name for your modem.

DNS: Using Names Instead of IP addresses

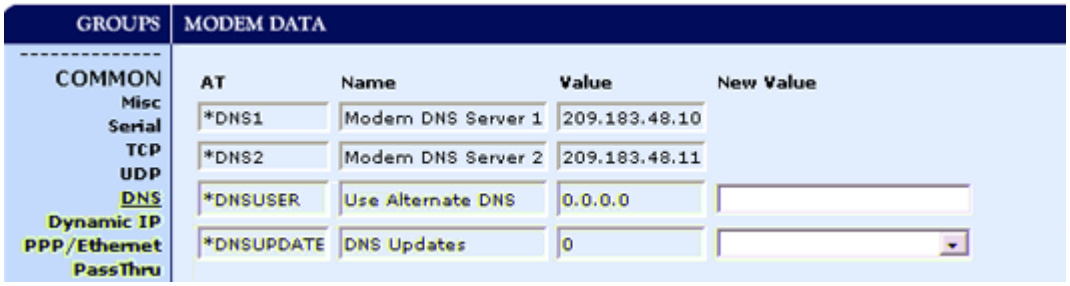
The PinPoint has the ability to query DNS servers in order to translate domain names into IP addresses. This allows you to use domain names in place of IP addresses for most of the configuration options requiring IP addresses. This is important if your PinPoint will need to contact another modem or other device that has a domain name but an unknown or dynamic IP address (such as another remote PinPoint using IP Manager).

Configuring DNS

Generally, when your PinPoint receives its IP address from Your Wireless Service Provider, it will also receive Your Wireless Service Provider's DNS servers to use for resolving (or translating) names to IP addresses which it will automatically configure in the modem settings. Unless your PinPoint will be used on a network with other modems or devices which have names internal to the local network or frequently changing IP addresses, the DNS servers provided by Your Wireless Service Provider should be all you need.

If the PinPoint will be communicating with a device that has a domain name but changes its IP address frequently (such as another AirLink modem using IP Manager) or is on a network where devices are accessed by names rather than IP addresses, you will want to put in an alternate DNS (*DNSUSER) where that domain is updated, such as the IP Manager server the remote modem is using or the listing of IP addresses to names is kept.

FIGURE 2. Wireless Ace: DNS



***DNS1** and ***DNS2** - The primary and secondary DNS servers set by Your Wireless Service Provider when your PinPoint gets its IP address.

***DNSUSER** - Set this, if desired, to an additional DNS server to query first before the primary or secondary (just as a hosts file is queried first on a computer). If *DNSUSER is set to 0.0.0.0, it will be ignored.

***DNSUPDATE** - This command sets how often you want DNS Updates to be requested. Otherwise the PinPoint will only send updates when it is reset, powered up, or the IP address is granted by network changes.



Note: If you will be using your PinPoint to communicate with another AirLink modem and both are using IP Manager to translate dynamic IP addresses to domain names, it is recommended that you set ***DNSUSER** to the IP address for IP Manager. IP Manager's updates occur more frequently than Your Wireless Service Provider's DNS servers decreasing the time between IP address change and address resolution. Likewise, if your PinPoint routinely needs to contact another modem or device with a Dynamic DNS domain and that modem or device frequently changes its IP address, you may need to set ***DNSUPDATE** for frequent updates.

PPP-Peer

The PinPoint use the unqualified domain name of "ppp-peer" when it is in PPP or SLIP address mode to resolve the address of the device or computer connected via PPP or SLIP address. If the PinPoint is not in PPP or SLIP address mode, "ppp-peer" will resolve to 0.0.0.0.

CHAPTER 5 DEVICE MODES

The PinPoint plays the part of a HOST when a computer or another device is connected to its serial or Ethernet port. The PinPoint can also route data to/from the connected device to the cellular network.



Note: The PinPoint moves data from one port to the cellular network in a simple **one-to-one** routing. It does not employ a routing table or any complicated routing protocol. If you need to have one-to-many routing, you can connect the PinPoint to a router. The router would provide the multiple routing and the PinPoint would provide one-to-one for the router to the cellular network and the Internet.

As the host, the PinPoint can use different communication modes.

AT: The PinPoint accepts and responds to standard AT commands.

PassThru: Direct connection to internal hardware (OEM Module) of the PinPoint.

Telnet: The PinPoint auto-answers TCP connections to allow terminal emulation using the cellular connection.

PPP Mode: The PinPoint uses PPP to communicate with a device or computer connected to the serial port.

SLIP Mode: The PinPoint uses SLIP to communicate with a device or computer connected to the serial port.

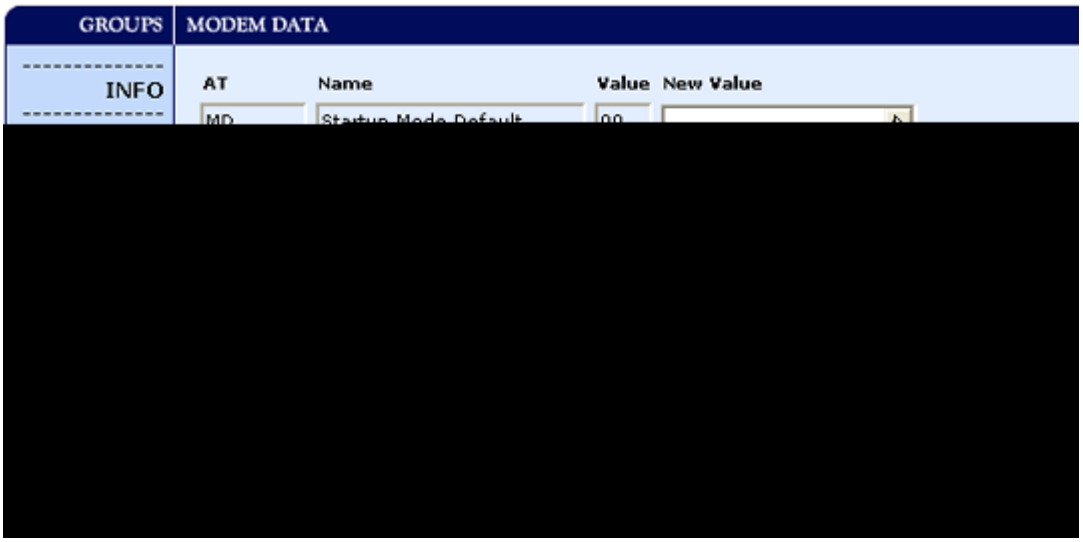
UDP and **UDP PAD:** Any data received on the serial port is assembled into UDP packets and sent to the session's associated IP address and Port (described later). Any responses received from the associated IP address and port destined for the modem's Device Port are unwrapped and sent out the serial port.

TCP and **TCP PAD:** Any data received on the serial port is packaged into TCP messages and sent to the associated connection's IP address and Port (described later). Any data received from the TCP peer is unwrapped and sent out the serial port.

By default, the PinPoint is in AT Mode and allows AT Commands to be entered via terminal connection (through the local port connection) or remotely (through the cellular network). PassThru Mode can only be exited by resetting the PinPoint. All other modes are entered by use of a startup mode command.

The serial port of the PinPoint can be configured to enter any of the modes automatically on power up (in most cases, this is also after it has registered on the cellular network). This is done by setting the Startup Mode Default (refer to **MD** in the AT Command listing, page 87) to the desired mode. If this setting is non-zero, the modem will enter the specified mode after 5 seconds. If you want to cancel this behavior, the **ATMD0** command can be used before the 5-second time-out expires.

FIGURE 1. Wireless Ace: MD



If the PinPoint is in any mode other than AT or PassThru, the AT command mode can be re-entered by:

- Deactivating DTR (if &D2 or Ignore DTR, S211, is not set).
- Issuing the +++ escape sequence (if Disable AT Escape, DAE, is not set).
- Resetting or Power cycling the modem.

Note: DTR needs to be asserted (S211=1 or &D0) by the host before PPP Mode, SLIP Mode, UDP PAD Mode, or TCP PAD Mode can be entered.

AT Mode

Using a terminal connection, AT commands are used to configure the modem, command it to do something, or query a setting. For a full listing of the AT commands, refer to page 59. Wireless Ace is a graphical user interface for most AT Commands.

AT commands must always be terminated by <CR> (ASCII character 0x0D), a carriage return (pressing enter on the keyboard). Some may also include a new line or line feed <LF>.

If **E=1** (Echo On), the AT command (including the terminating <carriage return) will be displayed (output) before any responses.

Two settings affect the format of AT command output: V (Verbose) and Q (Quiet).

If Q=1 (Quiet On), no result codes are output whatsoever, so there is no response generated by a (non query) command.

If Q=0 (Quiet Off), result codes are output. The format of this output is then affected by the Verbose setting.

If Quiet mode is off, the result code is affected as follows:

For V=1 (Verbose mode), the textual result code is surrounded by a carriage return and new line. Any AT query response is also surrounded by a carriage return and new line.

For V=0 (Terse mode), a numeric result code is output with a single trailing carriage return (no new line is output), while any AT query response is followed by a carriage return and new line (there is no preceding output).

For example, possible output to the AT command "AT" with carriage return (assuming quiet mode is not on) is:

carriage return - if V=0

carriage return and new line OK another carriage return and new line - if V=1

PassThru Mode

In PassThru mode, the PinPoint does not behave normally, all port communication is passed directly between the internal hardware and the computer connected directly to the modem. This mode can be used to configure hardware-specific settings (for example, provisioning, trouble shooting, etc.).

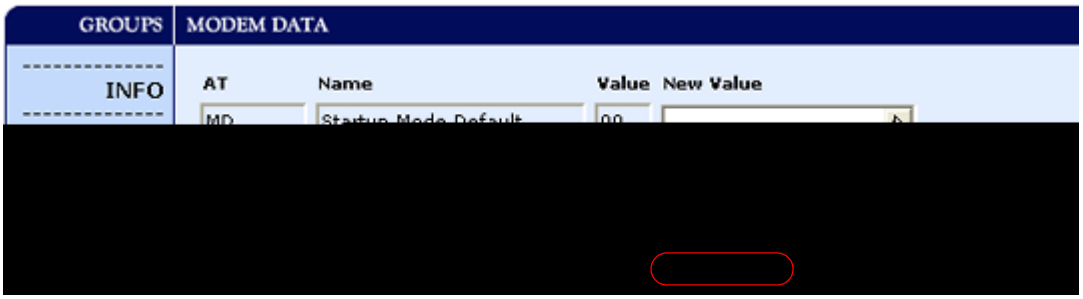
Issuing the "AT\APASSTHRU" from a terminal emulation enters this mode. The modem responds with OK, at which point a direct connection to the internal hardware is established.

With Wireless Ace, you can configure a string of AT commands to be sent to the PinPoint when it enters PassThru and other PassThru settings.

FIGURE 2. Wireless Ace: PassThru

You can configure MD to have the PinPoint enter PassThru on start up.

FIGURE 3. Wireless Ace: MD



Some internal hardware requires upwards of 20 seconds before AT commands can be entered, so be patient if there seems to be no response to AT commands.

Caution: PassThru can only be exited by resetting or power-cycling the modem. This mode cannot be entered via a remote Telnet session.

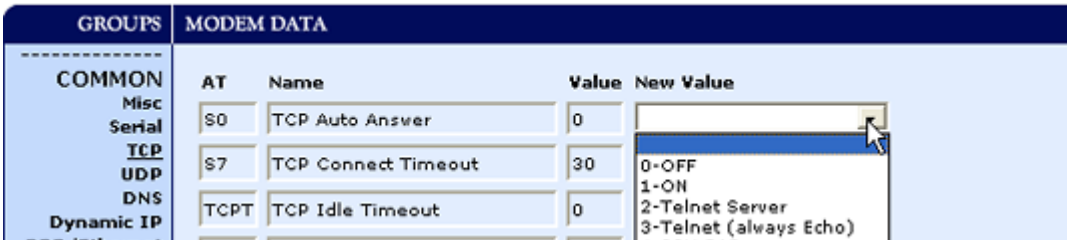
PassThru Mode allows only specific AT commands. Some ALEOS commands will be unavailable when the modem is in PassThru mode. The commands usable also depend heavily on the modem model number (found on the label on the top of the modem).

Caution: ALEOS is disabled in PassThru Mode. You cannot use most ALEOS specific commands while the modem is in PassThru Mode. While in PassThru mode, you also cannot use Wireless Ace to connect with the PinPoint.

TelnetMode

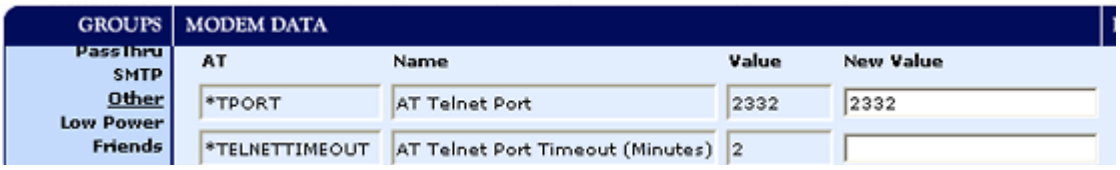
In Wireless Ace you can configure Telnet operation.

FIGURE 4. Wireless Ace: Telnet Configuration



If you need to change the port for Telnet (for example, you have the default port blocked on your firewall), the option is on the Other tab. The default telnet port is **2332**. You can also change the Telnet timeout, if the connection is idle, default 2 minutes.

FIGURE 5. Wireless Ace: Telnet Configuration



PPP Mode

In PPP mode, the PinPoint acts as a PPP server, providing an IP address, and DNS servers (if available) to the Host. PPP mode is entered from the AT mode by using any of the following commands:

AT\APPP

ATDT10.0.0.1

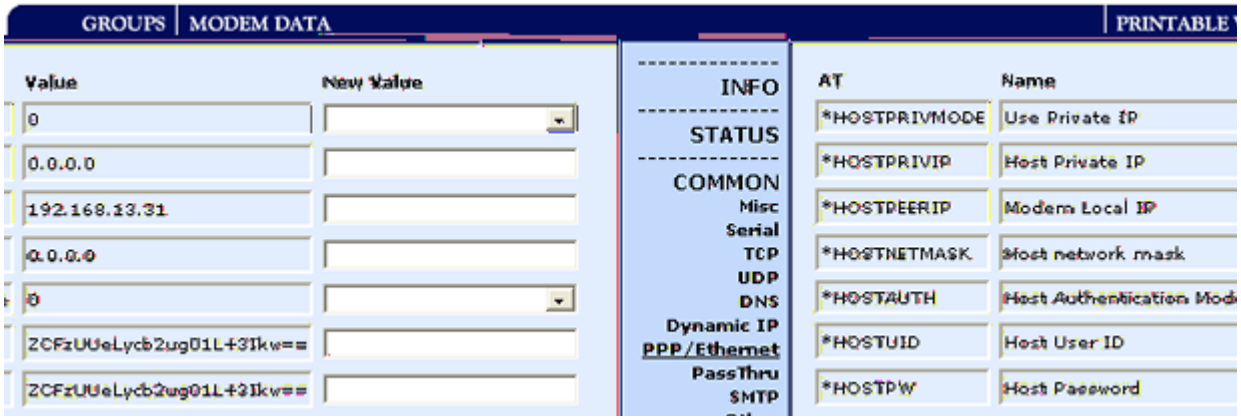
ATDT10001

ATD*99*1#**

CLIENT

In response to any of the preceding commands, the modem will respond with **CONNECT** a carriage return and new line and is ready for the host to begin PPP negotiations. The IP received by the host in the resulting negotiation will either be a private (non-routable) IP address or a public (network-routable) IP address provided by the network, depending on the settings of ***HOSTPRIVMODE**. If ***HOSTPRIVMODE=1**, the value of the private IP address can be determined beforehand by querying **S110**. The private IP address to be used can be defined with the command **AT*HOSTPRIVIP=192.168.100.33** substituting the desired IP address.

FIGURE 6. Wireless Ace: PPP/Ethernet



Using a private IP insulates the PPP client from changes in IP addresses of the underlying network. The will perform basic NAT-like address translation on all packets.

If a public IP address is being used, any changes in the IP (as determined by the wireless network) will result in the PPP link to the host being disconnected, requiring the host to reinitiate it. The public IP is passed to the host in the PPP negotiations, so when the network forces a change, the modem has to force the host to renegotiate the PPP link to make this happen.

Slip Mode

SLIP mode is entered be using the "**AT\ASLIP**" command. As in PPP Mode, the IP address that the host assumes is affected by the setting of ***HOSTPRIVMODE**. SLIP does not negotiate the IP with the host, so before making a SLIP connection, the host SLIP driver must be configured to use the IP specified by querying S110.

UDP Pad

When the modem is in UDP PAD (Packet Assembly and Disassembly) Mode, all characters received on the seial port are assembled into UDP packets and sent to the PinPoint's remote IP address/port, and any packets received from the same IP/port-destined for the PinPoint's device port (see *DPORT)--are disassembled and dumped onto the serial line.

A UDP session is initiated by one of the following events:

- Using the Dial UDP (DP) AT command (example, **ATDP192.168.3.23/3456**).
- Setting the Startup Mode Default (**MD**) to 3 (UDP) so that a UDP session is entered automatically when the modem registers onto the network. Serial data will be sent to the IP/port specified in **S53**.
- Incoming UDP packets will be processed out the serial port if
  - UDP auto answer is enabled (**S82=2**);
  - The destination IP address matches that in **S53** (if Friends Mode is enabled, the IP address also needs to be present on the Friends List);
  - Or allow any IP is set (**AIP=1**);
  - The modem is in AT mode (not in a current UDP or TCP session).

UDP packet assembly is affected by the values of **S50** (PAD Forwarding Time-out) and **S51** (PAD Forwarding Character). Data received in the serial buffer will be transmitted when the idle inter-character time-out specified in **S50** (in tenths of seconds) occurs or when a character is received that matches **S51** (if non-zero).

UDP Auto Answer

UDP auto answer (previously called UDP half-open) is set with S82=2. When set, the PinPoint will automatically establish a UDP session to the source IP address and port of the UDP packet received. The PinPoint will remain "locked" to this one remote IP/port until no data is sent or received for the time interval defined in the UDP auto answer time-out (S83). During this session, packets from other IP/port addresses will be rejected, unless *UALL is set. Whether or not an incoming packet will cause the modem to enter a UDP session is always dependent on the S53 and AIP settings.

The Normal UDP Mode (**MD3**) can be combined with UDP auto answer to cause the incoming serial data to be sent in UDP packets (instead of being treated as AT commands), while allowing sessions to be established from different UDP sources. A UDP session will be initiated either by incoming serial data or by an incoming UDP packet. The session, started by either method, will be terminated when no data has been sent or received for the **S82** period. Once the session terminates, another may be initiated by either means.

When idle, after the time-out has occurred, the modem is in AT command mode on the serial port, and any valid AT command may be entered during this time.



Note: It is best to ensure the idle time-outs for TCP and UDP are never **0** if you're going to be using auto-answer, or either PAD mode. In those circumstances, you will want the modem to close the socket if the connection goes idle for too long, particularly if the other side doesn't normally close the connection.

When the session is initiated by serial data, the new session will be established using the destination address specified in **S53**. The **S53** setting can be changed if the connect to last UDP setting (***UDPLAST=1**) is set. The address in **S53** will be updated to reflect the address of the last session initiated by an incoming UDP packet. So that when new data is received over the host serial port while in the idle state, a session will be re-established with the last address. (This behavior is the same as the previous Hybrid2 (**MD6**) mode).



Note: TCP auto answer (**S0**) may also be set simultaneously with UDP auto answer. Then, when in the idle state, the modem will accept either a TCP or UDP incoming packet, and enter a TCP or UDP session as appropriate.

Reliable UDP

Reliable UDP adds a simple protocol on top of UDP to provide reliable delivery of data. When data is received from the host serial port, a 2 byte header is added to the data, containing a message type and a sequence number. The PinPoint will continue to send this data (buffering any received data in the meantime) until it receives an acknowledgement with this sequence number. If an acknowledgement is not received within the time-out period (specified in S7), the data will be retransmitted. This will continue until an acknowledgement is received or the modem is reset. Likewise any UDP packets received by the PinPoint are expected to have this simple header. The PinPoint will issue an acknowledgement for any valid packets which are received.

To configure the PinPoint for a normal UDP session, you need to set the Startup Mode Default to 73 (**ATMD73**). If you are using two modems, configure the Destination IP and Port in each to point to each other. Serial data will then be sent reliably between the two.



Note: Although it adds reliability, the simple implementation of the Reliable UDP mode in the does not check for duplicate packets.

UDP Multicast Mode

UDP Multicast mode results in any data received from the host serial port being sent to all the clients in the address list. The remote port number is taken from S53. To avoid flooding the network, the packets are sent to each client with a 20ms pause in between. The receipt of UDP packets works as in normal UDP mode (i.e. bound by the value S53 and/or AIP). Since it may take a while to transmit the data to all hosts (especially if all 20 Modbus entries are used and name resolutions are required), new data received from the host port is buffered until current transmissions to all hosts are finished.

Enter the list of target IPs in the address list (**ADDR LIST**). The index numbers in the list aren't used. Configure for a normal UDP session. Set the Startup Mode Default to 83 (**ATMD83**). Configure the Destination port to match the device port of the remote modems.

TCP PAD

When the PinPoint is in a TCP session, all characters received on the serial port are assembled into TCP packets and sent to the mode's remote IP address/port, and any packets received from the remote end of the TCP connection are disassembled and dumped onto the serial line.

A TCP connection is established by one of the following methods:

- Using the Dial TCP (**DT**) AT command (for example, **ATDT192.168.3.23/3456**)
- TCP auto answer is enabled (**S1**), a TCP connection request is received, and the modem is not in a data session.
- Data is received on the serial port and
  - The Startup Mode Default (**MD**) is **4** (auto TCP)
  - The remote TCP destination, as defined in **S53**, successfully responds to the TCP connection request.

The value of **S7** (TCP Connection Time-out) specifies the number of seconds to wait, after initiating a TCP connection attempt, for a successful connection to be established. If the connection has not been successfully established before the time-out occurs, **ERROR/BUSY** is returned.

TCP packet assembly is affected by the values of **S50** (PAD Forwarding Time-out) and **S51** (PAD Forwarding Character). Data received in the serial buffer will be transmitted when the idle inter-character time-out specified in **S50** (in tenths of seconds) occurs or when a character is received that matches **S51** (if non-zero).

The TCP session will be terminated if no data is transmitted or received for the time interval specified in **TCPT** and **TCPS**. **TCPT** is the number of minutes (**TCPS=0**) or seconds (**TCPS=1**) used for this idle time-out.



Caution: TCPT should never be 0 when using the TCP mode. A broken TCP session can result in the modem being left with a TCP half-open connection that can only be terminated with a reset.

TCP Auto Answer

TCP auto answer (S0=1|2) also allows a TCP connection request to be "answered" when the modem is idle, not in a data session. The TCP connection request's destination port has to match the modem's device port.



Note: UDP auto answer may also be set simultaneously with TCP auto answer. Then, when in the idle state, the modem will accept either a TCP connection request or UDP incoming packet, and enter a TCP or UDP session as appropriate.

Hybrid Modes

Some previous hybrid modes (MD=5, 6) are no longer implemented as special, unique modes. Now that UDP auto answer (UDP Half-open, S82=2) can be enabled in conjunction with UDP PAD mode (MD3), effectively this is the same as MD5 and MD6 previously accomplished. Setting MD5 and MD6 are still supported, but not recommended.

AT Command	Hybrid Mode (MD5)	Hybrid Mode2 (MD6)
MD	3	3
S82	2	2
S0	1	1
*UDPLAST	0	1

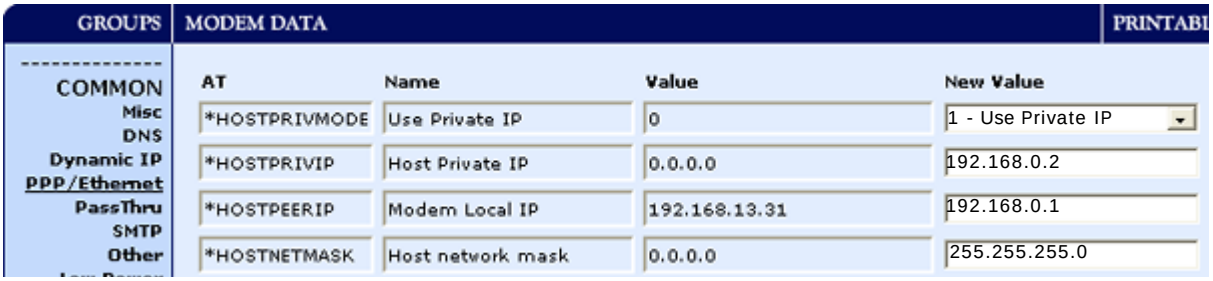
Public and Private Mode

By default, the PinPoint is in Public Mode and will pass the IP address assigned by the Your Wireless Service Provider network to the device connected to its port. If you need more control over which gateway address, device address, and netmask that is given out by the DHCP server, you can use the private host mode, *HOSTPRIVMODE, and set the internal network IP addresses. The PinPoint will use NAT to forward packets to the end device.

Note: When using Public mode, connect the modem directly to the computer or other end device. Using a hub or switch may prevent the modem from updating the IP address of the end device when an IP address is received from the Your Wireless Service Provider network.

In Wireless Ace, the Private mode settings are part of the **PPP/Ethernet** group.

FIGURE 7. **Wireless Ace: Private Host Mode**



- ***HOSTPRIVMODE** - Set to **1** to enable the explicit IP addresses.
- ***HOSTPRIVIP** - Set to the IP address you want the PinPoint to give to your device.
- ***HOSTPEERIP** - Set to the IP address you want for the PinPoint.
- ***HOSTNETMASK** - Set to the subnetmask (generally, 255.255.255.0).

Note: If you are using Private Mode (*HOSTPRIVMODE=1), you will need to make sure that *HOSTPRIVIP and *HOSTPEERIP are on the same subnet. If the subnet mask is 255.255.255.0, it is safe to use 192.168.*x.y* for each as long as the *x* is the same number (0 in the example screen shot above) and the *y* is different (1 and 2 in the example) and between 0 and 254. The screenshot shows an example.

Keepalive

Keepalive is used to test the PinPoint's connection by pinging an IP address after a specified period of inactivity. Keepalive is only recommended for users who have a remote terminated modem that infrequently communicates to the network or if you have experienced issues over time where the modem can no longer be reached remotely.

When Keepalive pings the IP address, an acknowledgement indicates there is an active connection to the network. If the PinPoint does not receive a response from the IP address, it will make additional attempts according to a backoff algorithm before determining the Internet connection is not functioning properly. If it determines the connection is not fucntioning, the modem will then attempt to reconnect to Your Wireless Service Provider to reestablish IP connectivity.

Configuring Keepalive

You can use Wireless Ace or a terminal connection to configure Keepalive (page 59). In Wireless Ace, select **Other** from the groups menu on the left.

FIGURE 8. Wireless Ace: Keepalive Configuration



***IPPING** sets the interval, in minutes, you want Keepalive to test the network connection. To disable Keepalive, set *IPPING to 0 (default setting).

Note: 15 minutes is the minimum time which can be set for Keepalive.

***IPPINGADDR** sets the IP address you want to use for the connection test.

Data usage using Keepalive

Keepalive is an optional feature. If you frequently pass data with your modem, you most likely do not need to have Keepalive enabled. When using Keepalive, be aware that a ping moves approximately 66 bytes of data over the network and is billable by the carrier. The following *IPPING settings will incur approximate monthly data usage in addition to any other data usage:

15 minutes	400k / month
30 minutes	200k / month
60 minutes	100k / month
120 minutes	50k / month

Caution: If ***IPPINGADDR** is left blank or is set to an invalid IP address (example, an IP which is unreachable or one which is not a valid IP address), modem performance will be adversely affected.

CHAPTER 6 E I & C

The PinPoint has special features for use in a mobile environment. The PinPoint can be configured to monitor the inputs on its serial port and respond to specific types of events. The PinPoint can also be configured to change its power mode in order to conserve power.

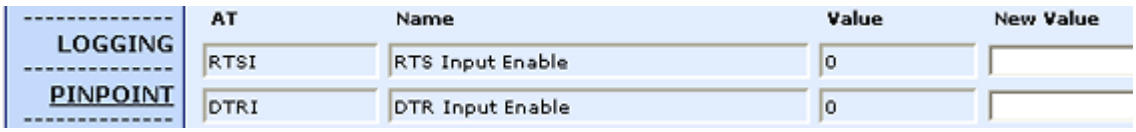
Capturing Events via External Inputs

The RS232 DB9 interface (the serial port) can be connected to digital switches and configured to capture contact closures using RTS and DTR to signal external or physical events (such as a tow bar being activated, opening a door or trunk, the car is turned on or off, etc.).

Setting the DTR and RTS

You can use either Wireless Ace, direct serial communication, or Telnet to configure the modem using AT commands (page 59). Select **PinPoint** from the menu on the left. Scroll down the command options until you see RTSI and DTRI.

FIGURE 1. Wireless Ace: DTR and RTS



To turn on the DTR (pin 4) digital sensing in the modem, *DTRI should be set to 1. To turn on the RTS (pin 7) digital sensing, *RTSI should be set to 1.

Note: To use only DTR or only RTS, you only need to configure the one you will be using.

Connecting to the Serial Port

You can connect a standard RS232 serial cable to the PinPoint serial port. If you want to use the DTR switch, wire in a Normally Open switch between the **DTR (pin 4)** and **signal ground (pin 5)**, the PinPoint's external case, or the power ground (refer to the figures below). If you want to use the RTS switch, use **RTS (pin 7)** to the ground (can use the same ground as DTR).

Caution: **Never apply voltage to the DTR or RTS inputs.** DTR and RTS can only be switched open or closed to ground.

You may be able to purchase a customizable serial cable to use with DTR and RTS inputs. Contact your AirLink representative for more information.

When the switch is closed and with ***PPINPUTEVT** configured, a RAP report will be sent to the destination IP address indicating that a contact closure has taken place (an external physical event has occurred). See “RAP Configuration” on page 40.

FIGURE 2. PinPoint back



FIGURE 3. Serial Port Diagram : Female DB-9 DCE (not to scale)

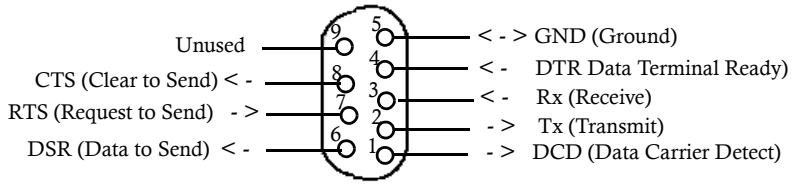
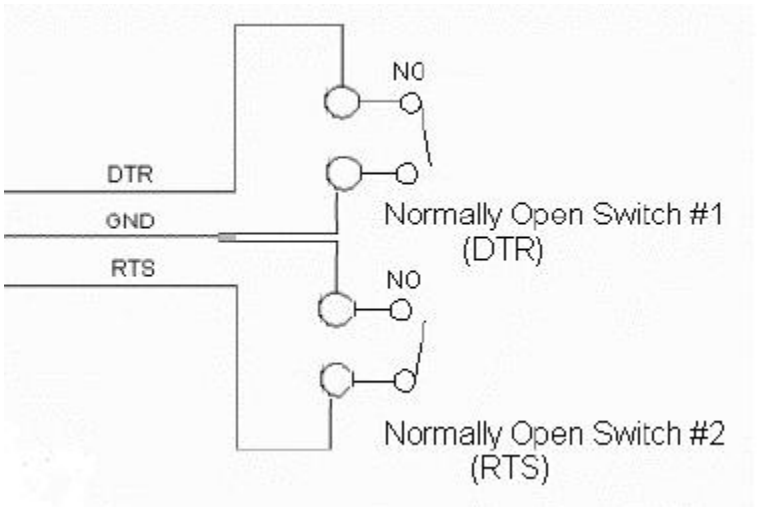


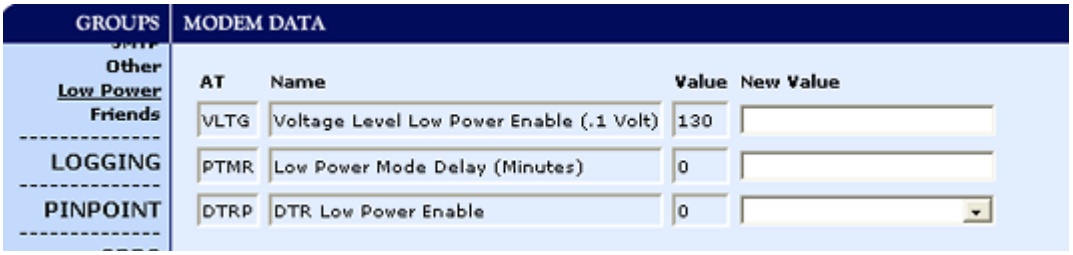
FIGURE 4. **DTR and RTS switches using Pin 5 (signal GND) as the common ground**



Power Modes

The PinPoint can be configured to switch power modes in response to specific events in order to conserve a vehicle's battery life. The stand-by state (low-power mode) will prevent the modem from draining the battery while allowing the modem to quickly power up to regular operation when it is needed.

FIGURE 5. **Wireless Ace: Low Power**



The PinPoint can power down and enter the stand-by state when the voltage to the modem drops below a configured threshold (such as when the vehicle is turned off), or when DTR changes (commonly a contact or voltage controlled by the key switch, signaling when the vehicle is turned off).

Note: If one or both DTR or RTS have been configured to be used as digital inputs, then low power mode cannot be configured to respond to DTR.

If you want to use Low Power Mode, you should choose either voltage level or DTR/RTS as the trigger, not both.

Power Effect on Modem State

Once the transition from powered on to standby, low-power mode starts, the modem will change state to AT mode. This results in the current mode being gracefully terminated. For the brief period when the modem is preparing for low-power mode, the modem will remain in AT mode (i.e. won't auto-answer, ATD will fail, etc.). Once low-power mode is entered, the modem will then discard any data received on the host port.

When the modem is woken from low-power mode, the same behavior occurs as upon power on. The modem starts in AT mode, and then after 5 seconds will enter the default mode (See “Host Modes” on page 20).

CHA E 7

G (G)

The PinPoint is equipped with a GPS receiver to ascertain its position to track the movements of a vehicle or other devices which move. The PinPoint relays the information of its location as well as other data for use with tracking applications.

Tracking Applications used with AirLink modems:

- Air-Trak
- Track Your Truck
- Track Star
- DeLorme Street Atlas USA
- Microsoft Streets and Trips
- CompassCom
- Zoll Data
- and many more...

GPS Overview

The Global Positioning System (GPS) is a satellite navigation system used for determining a location and providing a highly accurate time reference almost anywhere on Earth. The US military refers to GPS as Navigation Signal Timing and Ranging Global Positioning System (NAVSTAR GPS).

GPS consists of a “constellation” of at least 24 satellites in 6 orbital planes. Each satellite circles the Earth twice every day at an altitude of 20,200 kilometres (12,600 miles). Each satellite is equipped with an atomic clock and constantly broadcasts the time, according to its own clock, along with administrative information including the orbital elements of its motion, as determined by ground-based observatories.

A GPS receiver, such as the PinPoint, requires signals from four or more satellites in order to determine its own latitude, longitude, and elevation. Using time synced to the satellite system, the receiver computes the distance to each satellite from the difference between local time and the time the satellite signals were sent (this distance is called psuedoorange). The locations of the satellites are decoded from their radio signals and a database internal to the receiver. This process yields the location of the receiver. Getting positioning information from fewer than four satellites, using imprecise time, using satellites too closely positioned together, or using satellites too close to the Earth’s curve will yield inaccurate data.

The GPS data is then transmitted to a central location which uses a tracking application to compile information about location, movement rates, and other pertinent data.

Note: Depending on the location of the satellites in relation to the modem's location and how many signals are being received, the PinPoint may encounter "GPS drift". The PinPoint may report it is in a location a few feet from its actual location because it does not employ differential GPS.

AirLink Remote Access Protocol (RAP)

The AirLink Remote Access Protocol (RAP) is a proprietary binary message format. The PinPoint uses the UDP (User Datagram Protocol) to communicate with the host server. RAP was originally designed to work specifically with AirLink Tracking System (ATS), but other 3rd party applications have been developed to take advantage of the RAP messaging format.

Examples of tracking applications using RAP:

- Air-Trak
- TrackStar
- CompassCom
- Zoll Data
- HTE
- Spillman
- and others...

National Marine Electronics Association (NMEA)

National Marine Electronics Association (NMEA) is a protocol by which marine instruments and most GPS receivers can communicate with each other. NMEA defines the format of many different GPS message (sentence) types, which are intended for use by navigational equipment.

Example of a tracking application using NMEA:

- Microsoft Streets and Trips

Trimble ASCII Interface Protocol (TAIP)

Trimble ASCII Interface Protocol (TAIP) is a digital communication interface based on printable ASCII characters over a serial data link. TAIP was designed specifically for vehicle tracking applications but has become common in a number of other applications, such as data terminals and portable computers, because of its ease of use.

Example of a tracking application using TAIP:

- DeLorme Street Atlas USA

Datum

In addition to different reporting protocols, the PinPoint supports the most widely used GPS datum. The GPS datum is the method of ascertaining the position of the GPS device using a specific reference point location. The datum used can influence the accuracy of the GPS positioning.

Datum Supported by the PinPoint:

- WGS84
- NAD83
- NAD27

Real-Time Clock Sync

Every hour, the PinPoint will sync the internal Real Time Clock (RTC) with the Universal Time Coordinated (UTC) received from the GPS satellites.

Many tracking applications will translate the time reported by the PinPoint as part of the GPS message to the appropriate local time zone using the UTC offset (i.e. California is UTC-8 and New York is UTC-5).

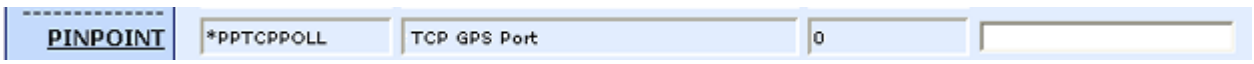
Note: Wireless Ace displays the current time (UTC) set in the modem and does not translate it to the local time zone. If the modem is in California and it is 8 a.m., the modem's time will be shown as 4 p.m, since UTC is 8 hours "ahead" of Pacific time (UTC+8).

TCP GPS Polling

The PinPoint can easily and quickly be polled for location by opening a TCP connection to port 9494 (default). Once the connection is established, the PinPoint will send a report with the current position using the GPS report type the modem is configured to use.

You can change the port for the TCP GPS poll using *TCP.

FIGURE 1. Wireless Ace: *PPTCPPOLL



Note: As a security measure, the TCP connection to the *PPTCPPOLL port must be from the IP address specified for the ATS Server IP in *PPIP.

Configuring the PinPoint for GPS

To configure your modem's GPS settings, you can use either Wireless Ace or a terminal connection to configure the modem using AT commands (page 59). The configuration examples in this chapter all use Wireless Ace. Most of the settings are in the group: **PinPoint**.

Before you Begin to Configure GPS

To decide what configuration you need for your PinPoint, there are some fundamental considerations:

1. **Protocol:** What is the GPS protocol used by your tracking application and what type of reports will you need?
2. **Datum:** What is the datum supported by your tracking application?
3. **DNS:** Will you need DNS support?

The main sections below detail how to set up the configuration for RAP (page 40), RAP special features (page 42), RAP Store and Forward (page 44), NMEA (page 46), and TAIP (page 47). Most of the PinPoint commands are covered in the main sections below.



You can use a fully qualified domain name instead of an IP address for most configuration options calling for an IP address if your PinPoint is configured to use DNS. DNS settings frequently come directly from Your Wireless Service Provider while your PinPoint is registering on the cellular network and receiving it's IP address.

Configuring the Datum

You can change the Datum used by your PinPoint by configuring *PPGPSDATUM. Match the Datum to the Datum used by your tracking appliction.

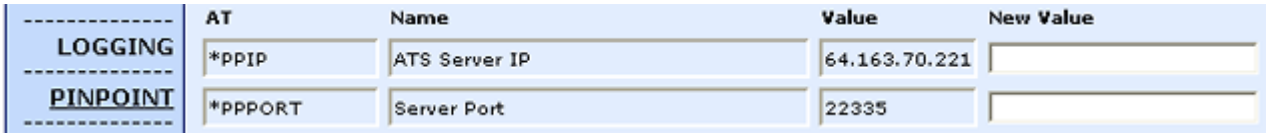


Note: Some PinPoint models do not support configuring the Datum with Wireless Ace. If the option does not appear in Wireless Ace when you connect to the PinPoint, then your modem does not support it.

Over-The-Air (Remote) Host

To set the PinPoint to report to an external or remote host, configure *PPIP (ATS Server IP) and *PPPORT (Server Port). *PPIP will work with any remote host.

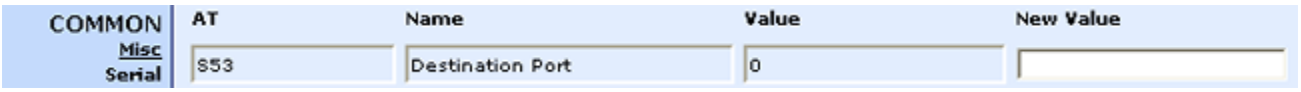
FIGURE 2. Wireless Ace: *PPIP and *PPPORT



Local Host

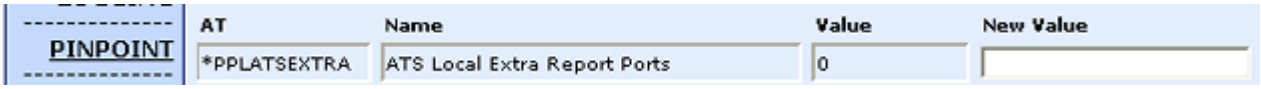
To set the PinPoint to report to a local host, one directly connected to the PinPoint's serial port, configure the port to be used with **S53 - Destination Port**. The local IP address will automatically be used for local reports. S53, in Wireless Ace, is part of the **Misc** menu option.

FIGURE 3. Wireless Ace: S53



If you need to send reports to additional local ports, you can specify other ports with ***PPLATSEXTRA**. Local Reports can be sent to up to 7 additional ports consecutively following the S53 port. If S53=1000 and *PPLATSEXTRA=4, reports will be sent to 1000, 1001, 1002, 1003, and 1004. In PPLATSEXTRA, specify the number of ports where you want the reports sent, 0 to 7 (0 disables extra ports).

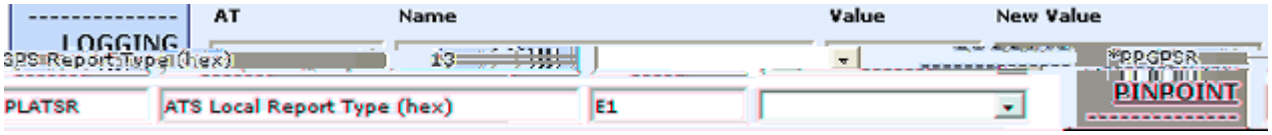
FIGURE 4. Wireless Ace: *PPLATSEXTRA



Report Types

There are several report types available. For remote reports, set *PPGPSR. For local reports, set *PPLATSR. These settings are not next to each other, but are on the same page.

FIGURE 5. Wireless Ace: *PPGPSR and *PPLATSR



0 - *MF, Legacy reports for use with ATS version 4 and older. **11** - Global Positioning System (GPS) data.

12 - GPS data with the UTC time and date.

13 - GPS with time and date and Radio Frequency data from the antenna. **D0** - Xora reports.

E0 - NMEA GGA and VTG sentences.

E1 - NMEA GGA, RMC, and VTG sentences.

F0 - TAIP data

F1 - TAIP compact data

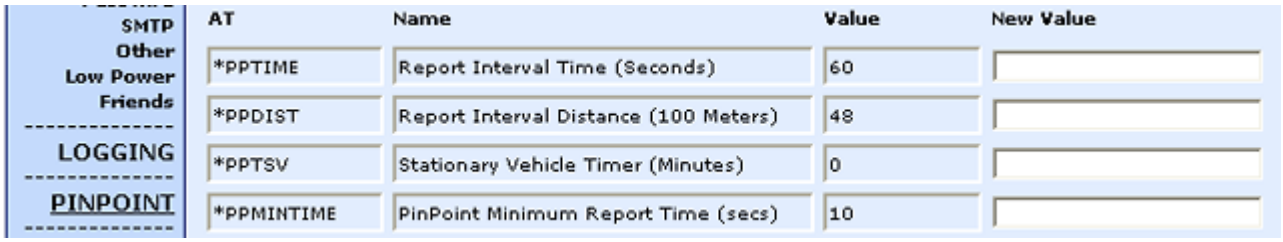


Note: The PinPoint can be configured to supply one type of report to a remote host and a different report type locally through the serial port at same time. However, there may be conflicts due to the local and remote reporting being in different modes and not all features to both modes may be available.

Sending Reports Automatically

You can configure the PinPoint to send reports based on a time interval and on the movement of a vehicle (based on it's position from one time to the next).

FIGURE 6. Wireless Ace: Automatic Reports



***PPTIME** - Location report sent every set time interval (seconds).

***PPDIST** - Location report sent only if the position is more than the set distance (x 100 meters).

***PPTSV** - Location report sent if the vehicle has been in one location (stationary) for more than a set time interval (minutes).

***PPMINTIME** - Location report sent be sent at no less than this time interval (seconds).



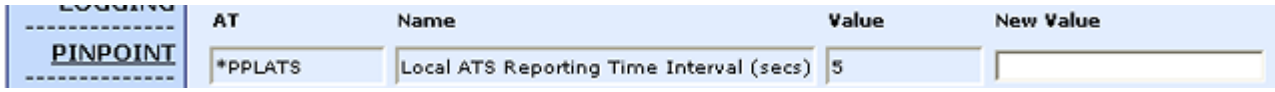
Note: If you're implementing both a time interval and distance interval for reports, the PinPoint will use the timer which expires first.
The reporting interval can impact your data usage. If the interval is set frequently, you may want to have a high usage or unlimited data plan.



One mile is approximately 1600 meters. 1000 meters is one kilometer.

If you are sending reports on the local serial port, and/or if you want them sent automatically, you will need to set ***PPLATS**. The time interval, just as for *PPTIME, is in seconds.

FIGURE 7. Wireless Ace: Local Automatic Reports



The PinPoint can be configured to wait a specific amount of time after initialization before any reports are sent.

FIGURE 8. Wireless Ace: GPS Initialization Timer



RAP Configuration

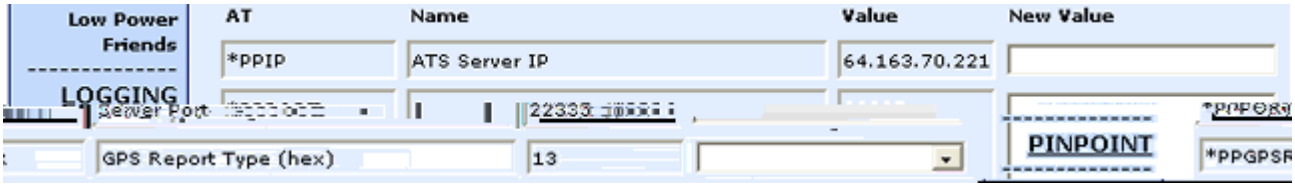
RAP has additional features which allow reports based on external physical events, input from a 3rd party devices, store and forward processing, etc.

Most of the configuration settings for RAP can be changed with the RAP configuration command message. Refer to the AirLink Tracking System User Guide.

RAP Reports Over-The-Air (Remote)

To configure the PinPoint to send RAP reports to a remote server, you will need to set 3 commands: *PPIP, *PPPORT, and *PPGPSR.

FIGURE 9. Wireless Ace: RAP Reports Remote



1. Set the IP (*PPIP) and port (*PPPORT) to the IP and port of the server to which you want the reports sent.
2. Set the GPS Report Type (*PPGPSR) to your preferred RAP report type.

   11 - GPS - Global Positioning System data

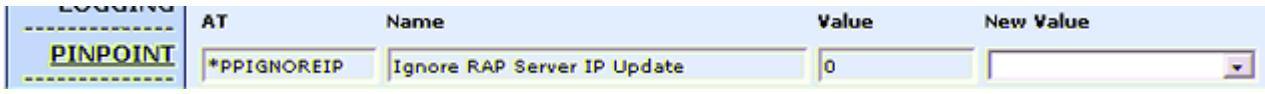
   12 - GPS + Date - GPS data with the UTC time and date

   13 - GPS + Date + RF - GPS data with the UTC time and date and Radio Frequency information from the antenna.

If you need to use a dynamic IP address for the host server, you can use the RAP configuration command to change the value for *PPIP (see below).

Note: If your PinPoint is on a mixed network (some of the fleet on another cellular network), you will need to specify the IP of the server in *PPIP and configure the PinPoint not to change the server IP with a RAP configuration command using *PPIGNOREIP. This will prevent the ATS server configuration packets from changing the *PPIP value.

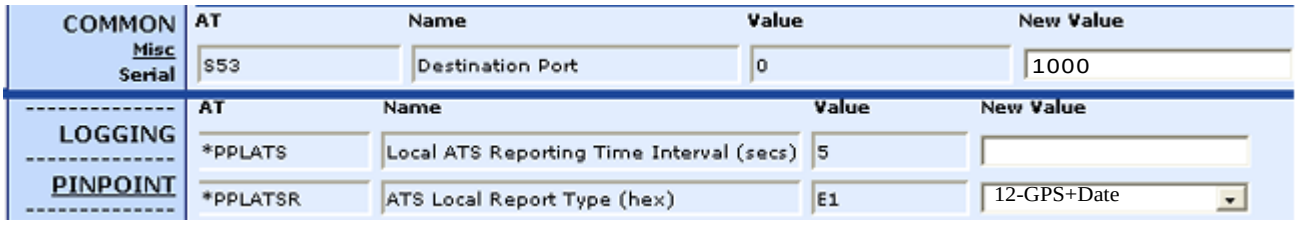
FIGURE 10. Wireless Ace: *PPIGNOREIP



RAP Reports over a Local Connection (PPP or SLIP)

Local reports are sent to the local IP address of the computer or device connected to the serial port of the PinPoint using PPP or SLIP. To configure the modem to send to the local IP, you will need to set 3 commands: S53, *PPLATS, and *PPLATSR.

FIGURE 11. **Wireless Ace: RAP Local Reports**



1. Set the port (S53) to the local port to which you want the reports sent. The local IP will automatically be used. S53, in Wireless Ace, is part of the **Misc** menu option.
2. Set the ATS Local Report Type (*PPLATSR) to your preferred RAP report type.

   11 - GPS - Global Positioning System data

   12 - GPS + Date - GPS data with the UTC time and date

   13 - GPS + Date + RF - GPS data with the UTC time and date and Radio Frequency information from the antenna.
3. Set Local ATS Reporting Time Interval (*PPLATS) to the number of seconds you want as an interval between reports being sent. If *PPLATS is set to 0, reports will only be sent if a poll command is issued by the local client.

RAP Message format

In a RAP-based system, each PinPoint sends command status and responses to the Server which is master and sends commands to one or more PinPoint devices

For reliability, the server expects each command to be acknowledged within a time-out period. If the acknowledgement packet (ACK) is not received within the time-out period, the server will retransmit the command.

The RAP messages are in Hex and are referred to by their message ID.

GPS Reports

0x11 Simple GPS Report - Report contains GPS latitude and longitude in 1/100,000 degrees, GPS velocity in kilometers/hour, GPS Direction in 2 degree increments, UTC time (but not date), GPS satellite count and quality, and optional data.

0x12 Simple GPS Report with the addition of the UTC date.

0x13 Simple GPS Report with the addition of the UTC date and including radio frequency data with the GPS point.

0x20-0x23 indicate the state changes of either the RTS or DTR (See “Store and Forward for RAP” on page 44.) in addition to the same data as in an 0x12 report.

0x24-0x2B indicate the state changes of the COM1000 inputs (See “COM1000 Event Reports” on page 43.) in addition to the same data in an 0x12 or 0x13 report.



Note: It is recommended to use Report type **0x12** or **0x13** when Store and Forward (page 44) is enabled.

Power Reports

0x10 Power Up Report - Sent by the modem when it is powered up (either as a result of being power cycled or with a software reset).

0x30 Power Sleep Report - Sent by the modem when it is about to power down into a low-power state (not supported in some early PinPoint models).

0x31 Power Wakeup Report - Sent by the modem when it is returned to a full power state from a low-power state (not supported in some early PinPoint models)

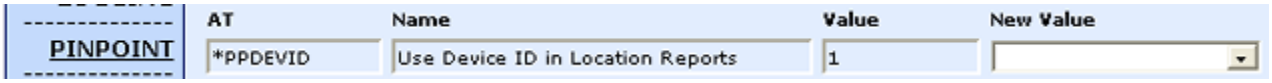
Additional RAP Features

RAP allows additional information to be sent with the reports to enable a richer tracking feature set. Configure RAP as you would normally for remote or local reports (See “RAP Configuration” on page 40.).

Device ID

By enabling *PPDEVID, the device ID is sent as part of the RAP message to make identification easier in a network or fleet of vehicles equipped with PinPoint modems.

FIGURE 12. Wireless Ace: *PPDEVID



Caution: If the PinPoint is using a dynamic IP, *PPDEVID needs to be enabled.

With the device ID enabled, the PinPoint will use the value configured for **NETPHONE** unless NETPHONE is empty in which case the ESN of the modem will be used.

Odometer Data in Reports

When the odometer is enabled, the PinPoint will calculate distance based on GPS data. The modem’s odometer calculations can be included in the RAP message.

FIGURE 13. Wireless Ace: Odometer Reports



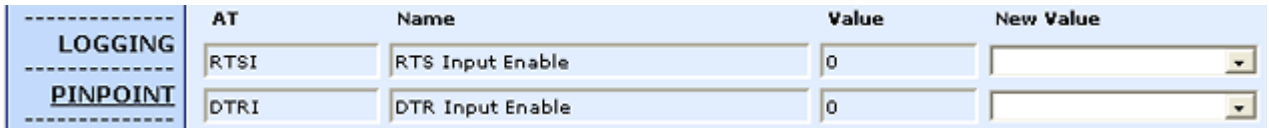
Note: The PinPoint's odometer calculations may not match the odometer in the vehicle itself. The PinPoint odometer is not connected to the vehicle's, it is entirely based on calculations of GPS readings.

Serial Input Event Reports

You can configure the PinPoint to send reports based on the state of the DTR and/or RTS pins on the serial port. Refer to "Capturing Events via External Inputs" on page 30 to set up the external devices.

Once the serial port has been connected, you will also need to enable the event reporting for GPS.

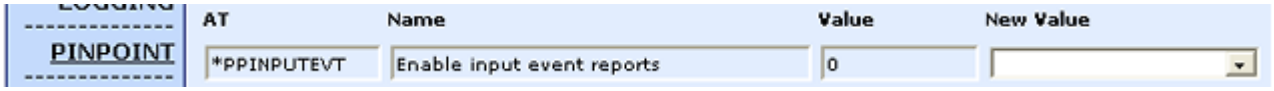
FIGURE 14. Wireless Ace: Enabling RTS and DTR for Input Events



If you have connected the physical device to the RTS pin and ground, you will need to enable RTSI. If you have connected it to the DTR pin and ground, you will need to enable DTRI. You can have different devices connected to each. If you have two connected, enable both.

To enable the reports themselves, use *PPINPUTEVT.

FIGURE 15. Wireless Ace: Input Event Reports



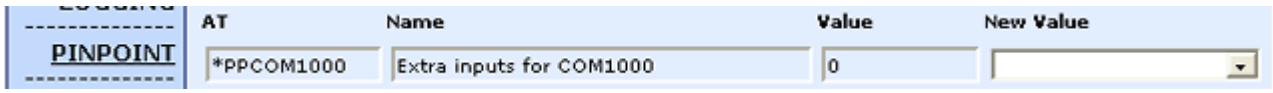
The report type will indicate the state of change in either RTS or DTR. The contents of the report will be the same as Report Type **0x12** (GPS data with date) with the addition of the event report.

Input	Value	Report Type
DTR	0	0x20
DTR	1	0x21
RTS	0	0x22
RTS	1	0x23

COM1000 Event Reports

Support for the COM1000 is enable with the command ***PPCOM1000=1**. Once enabled, ALEOS will receive the reports from a properly configured COM1000 and add the state of the extra inputs to RAP packets sent to ATS.

FIGURE 16. Wireless Ace: COM1000 Events - *PPCOM1000

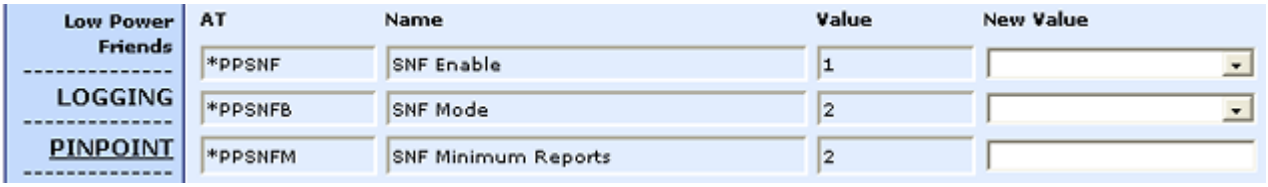


The report type will indicate the state of change in the inputs. The contents of the report will be the same as Report Type **0x12** (GPS data with date) or **0x13** (GPS data with date and RF data) with the addition of the event report.

Store and Forward for RAP

Store and Forward RAP can provide seamless coverage even in areas with intermittent cellular coverage. If the PinPoint leaves coverage or has very low signal (an RSSI of -105 or lower), it will store the GPS messages in memory. When the modem re-enters cellular coverage, it will then forward the messages as configured. The PinPoint can also store messages and send them to the server in a packet rather than individually to conserve bandwidth.

FIGURE 17. Wireless Ace: Store and Forward



Once you have enabled SnF, *PPSNF, you can determine how you want the messages sent using *PPSNFB, Store and Forward Mode:

Normal - Each report is sent immediately.

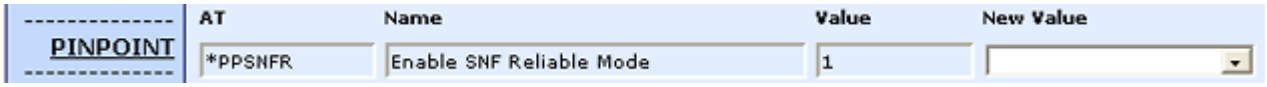
Polled - Reports held until requested by the server.

Grouped - Reports held until the total is equal or greater than *PPSNFM which sets the packet size of grouped reports.

Store and Forward Reliable Mode

The Store and Forward Reliable Mode allows the PinPoint to ensure all messages are received by the server even if the connection between them goes down for a period of time (such when a vehicle passes through a location where the cellular signal is weak or non-existent).

FIGURE 18. Wireless Ace: Store and Forward Reliable Mode



With Reliable Mode enabled, *PPSNFR, the PinPoint will transmit a sequence number (1 to 127) as part of a packet of messages (may contain one or more reports). To reduce overhead, the server only acknowledges receipt of every eighth packet. The PinPoint considers that 8 a “window” of outstanding packets.

If the PinPoint doesn’t receive acknowledgement for a “window”, the modem will PING the server with a message containing the sequence numbers of the first and last packets that haven’t been

acknowledged. The PinPoint will continue until the server acknowledges receipt. When the Pin Point receives the acknowledgement, it will advance its “window” to the next group.

When the PinPoint is first powered on (or reset), it will send a Set Window message to sync up with the server for the current “window”.

On the other side, if the server receives an out of sequence packet, it will send a message to the modem noting the missing sequence and the PinPoint will retransmit.

GPS Time, Latitude, and Longitude can be added to UDP, TCP, GPS, to the packet sequence data for Reliable Mode.

FIGURE 19. Wireless Ace: Adding GPS Time, Latitude, and Longitude to Reliable UDP data

Note: Using SnF Reliable Mode can cause excessive data traffic if the sequence number is not returned.

Sending Reports

You can configure the PinPoint to send reports based on a time interval and on the movement of a vehicle (based on it’s position from one time to the next).

FIGURE 20. Wireless Ace: Automatic Reports

*PPTIME - Location report sent every set time interval (seconds).

*PPDIST - Location report sent only if the position is more than the set distance (x 100 meters)

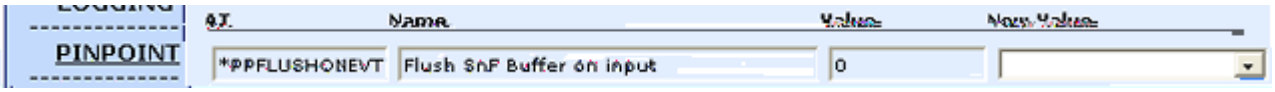
*PPTSV - Location report sent if the vehicle has been in one location (stationary) for more than a set time interval (minutes).

*PPMINTIME - Location report sent at no less than this time interval (seconds).

Flush on Event

If you have events enabled, with *PPFLUSHONEVT, you can configure the PinPoint to flush the SnF buffer when an event occurs. This will immediately send all pending SnF messages to the host. This allows an event, such as a vehicle being powered on or a tow bar activated, to be immediately sent, so its cause can be acted on without delay.

FIGURE 21. **Wireless Ace: Store and Forward Flush on Event**



Note: Outstanding packets can include messages already sent to the server that haven't been acknowledged (SnF Reliable Mode) whether they have been received by the server or not.

NMEA Configuration

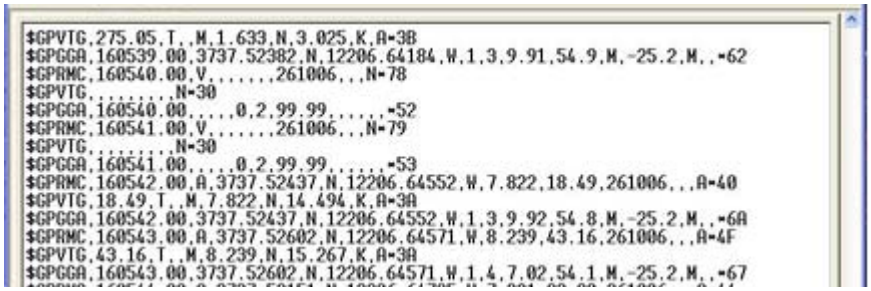
The PinPoint transmits standard NMEA GPS messages as well as the proprietary RAP format.

Streaming NMEA Messages over the local port

The PinPoint can be configured to send standard NMEA messages (sentences) in ASCII over the serial port without a PPP connection to the local computer. For examples of the message format descriptions, refer to page 136.

Send the command **ATGPS1** to the serial portto begin the NMEA stream. The example below shows the stream in HyperTerminal connecting directly to a PinPoint via the comport.

FIGURE 22. **HyperTerminal: NMEA Stream**



To stop the stream, with either terminal connection, use the command **ATGPS0** (this can be entered even while data is streaming). You can also use **AT*PGPS=1** then **AT&W** to allow you to stream the data even after the modem is reset.

You can also issue this command using Wireless Ace to stream the data from the serial port without using HyperTerminal or another terminal application. The data will stream even after the modem is reset.

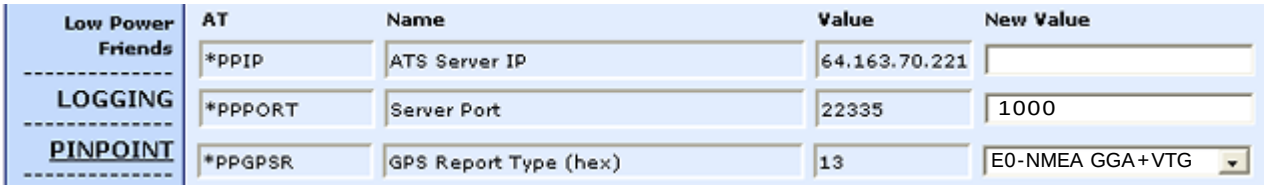
FIGURE 23. **Wireless Ace: NMEA Strings**



NMEA Messages Over-The-Air (Remote)

To configure the PinPoint to send NMEA reports to a remote server, you will need to set 3 commands: *PPIP, *PPPORT, and *PPGPSR.

FIGURE 24. Wireless Ace: NMEA Remote Reports



1. Set the IP (*PPIP) and port (*PPPORT) to the IP and port of the server to which you want the reports sent.
2. Set the GPS Report Type (*PPGPSR) to your preferred NMEA sentence format.

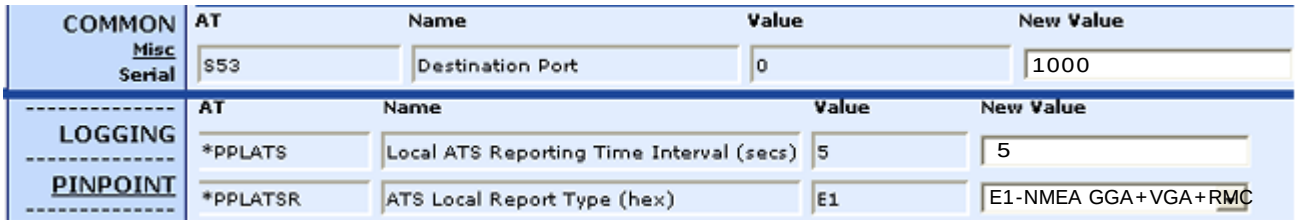
   E0 - Output the GGA and VTG sentences.

   E1 - Output the GGA, RMC, and VTG sentences.

NMEA Messages over a Local Connection (PPP)

Local reports are sent to the local IP address of the computer or device connected to the serial port of the PinPoint using PPP. To configure the modem to send to the local IP, you will need to set 3 commands: *S53, *PPLATS, and *PPLATSR.

FIGURE 25. Wireless Ace: NMEA Local Reports



1. Set the port (S53) to the local port to which you want the reports sent. The local IP will automatically be used. S53, in Wireless Ace, is part of the **Misc** menu option.
2. Set the ATS Local Report Type (*PPLATSR) to your preferred NMEA sentence format.

   E0 - Output the GGA and VTG sentences.

   E1 - Output the GGA, RMC, and VTG sentences.
3. Set Local ATS Reporting Time Interval (*PPLATS) to the number of seconds you want as an interval between reports being sent.

TAIP Emulation Configuration

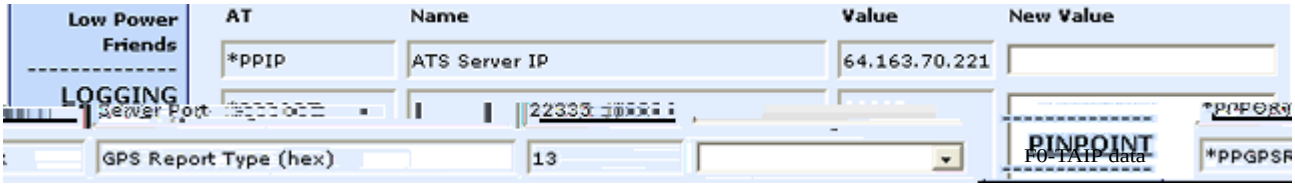
The TAIP emulation functionality allows the PinPoint to operate in a limited manner with clients which only understand the Trimble ASCII Interface Protocol (TAIP).This emulation is enabled by

setting the GPS report format, directing the modem to listen for TAIP messages, and disabling AirLink Binary/ATS formatted messages. For the message format descriptions, refer to page 138.

TAIP Messages Over-the-Air (Remote)

To configure the PinPoint to send TAIP reports to a remote server, you will need to set 3 commands: *PPIP, *PPPORT, and *PPGPSR.

FIGURE 26. Wireless Ace: TAIP Remote Reports



1. Set the IP (*PPIP) and port (*PPPORT) to the IP and port of the TAIP server.
2. Set GPS Report Type (*PPGPSR) to **F0-TAIP** data.

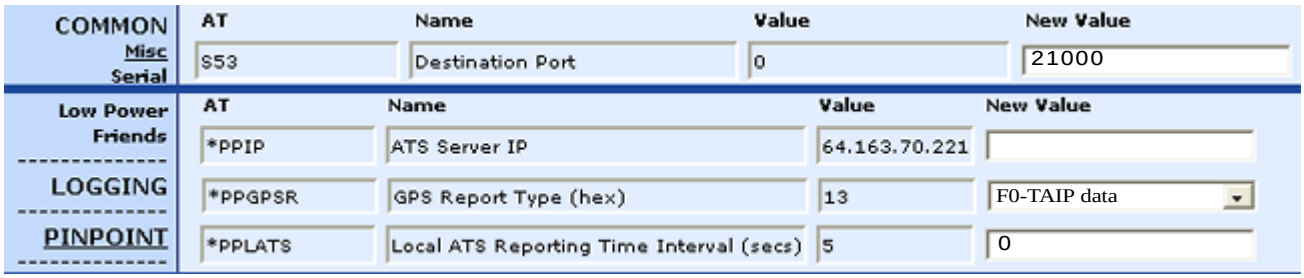


Note: Unlike standard TAIP which simply sends to the last client to request automatic reports, the remote reports are sent to the destination address (*PPIP) and destination port (*PPPORT).

TAIP Messages over a Local Connection (PPP)

Some TAIP client applications can send TAIP requests and listen for reports using a local connection. Generally this is done over the serial port using PPP. To configure this option, you will need to set four commands: *PPIP, S53, *PPGPSR, and *PPLATS.

FIGURE 27. Wireless Ace: TAIP Local Reports



1. Set the IP (*PPIP) to the local IP of the PinPoint (if you are receiving reports using PPP, you do not need to set *PPIP).
2. Set the port (S53) to **21000**. The local IP will automatically be used. S53, in Wireless Ace, is part of the **Misc** menu option.
3. Set GPS Report Type (*PPGSPR) to **F0 - TAIP Data**.
4. Set the Local ATS Reporting Time Interval (*PPLATS) to **0** to disable unsolicited local reports.

With this configuration, the PinPoint will listen for TAIP requests on the local IP (192,168.13.31 by default) and port 21000. Once a TAIP request command has been received, the PinPoint will

begin issuing TAIP reports (e.g. DPVs) to the local IP and port 21000. The client application should be listening for reports on this IP address and port.

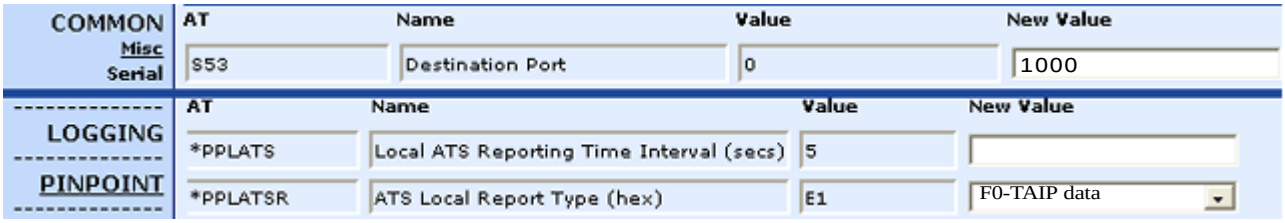
No unsolicited reports will be sent from the PinPoint to the local client application.

Sending Unsolicited TAIP Messages over a Local Connection (PPP)

Standard TAIP requires a request before GPS reports are sent. The PinPoint, however, can be configured to allow TAIP formatted messages to be sent over any UDP Port without request commands. This is useful for those applications which can listen for TAIP messages but cannot send UDP request packets.

This configuration sends TAIP GPS reports to whatever address and UDP Port you select. You will need to set 3 commands: S53, *PPLATS, and *PPLATSR.

FIGURE 28. Wireless Ace: TAIP Local Reports, Unsolicited

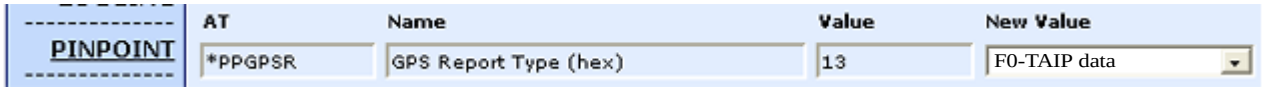


1. Set the port (S53) to **1000**. The local IP will automatically be used. S53, in Wireless Ace, is part of the **Misc** menu option.
2. Set ATS Local Report Type (*PPLATSR) to **F0 - TAIP Data**.
3. Set the Local ATS Reporting Time Interval (*PPLATS) to **5** to send reports every 5 seconds (can be adjusted as circumstances warrant).

Using TAIP Command Emulation

To configure the PinPoint to use TAIP emulation set GPS Report Type (*PPGSPR) to **F0 - TAIP Data**.

FIGURE 29. Wireless Ace: TAIP Emulation

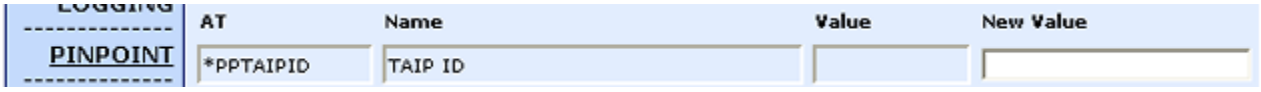


Note: With TAIP emulation, the PinPoint will listen for TAIP messages on port 21000. RAP will be disabled and no RAP messages or commands will be sent or received on that port.

TAIP ID

The TAIP messages can be configured to send the user specified identification number (ID). This greatly enhances the functional capability of the unit in a network environment. Set the ID using *PPTAIPID.

FIGURE 30. Wireless Ace: TAIP ID



Supported TAIP Commands

The TAIP emulation will accept the following TAIP message types:

SRM (Set Reporting Mode) allows the client to set the reporting mode configuration. The report mode configuration is not stored in non-volatile memory and such should be resent upon a unit reset. This behavior emulates that specified in TAIP specifications.

QRM (Query Reporting Mode) reports the reporting mode configuration (returns an “RRM” message).

SID (Set ID) allows the client to set the TAIP ID (AT*PPTAIPID can also be used to set the TAIP ID). The TAIP ID, when set with a “SID” message, will be written to non-volatile memory.

QID (Query ID) reports the TAIP ID (returns an “RID” message).

DPV configures automatic reporting of PV (Position/Velocity) reports based on distance traveled and a maximum time. The delta distance value specified in the message is converted to hundreds of meters and stored as *PPDIST. The maximum time interval is stored as *PPTIME. Currently the minimum time and epoch values are ignored.

FPV configures periodic reporting of PV (Position/Velocity) reports. The time interval from the message is stored at *PPTIME. Currently the epoch value is ignored.

QPV (Query Position Velocity) responds with a PV (Position/Velocity) report.

The TAIP emulation will generate the following reports corresponding to the appropriate event (either a query for it, echoed due to a set, or due to an automatic reporting event).

RRM (Report Reporting Mode) reports the reporting mode configuration.

RID (Report ID) reports the TAIP ID.

RPV (Report Position/Velocity) reports Position/Velocity.

CHA E 8 H d I

Your AirLink PinPoint should be mounted in a position that allows easy access for the cables so they are not bent or constricted. The LEDs on the front panel should be visible for ease of operational verification. You should ensure that there is adequate airflow around the modem but that it is kept free from direct exposure to the elements (sun, rain, etc.)

Possible locations for your PinPoint installed in a vehicle are in a trunk away from where luggage or other items won't be likely to dislodge it, under or in the console, or behind seats. Ensure the location is secure both against abrupt movements of the vehicle and from other items coming into contact with the modem.

An optional accessory for your PinPoint is a mounting kit. The bracket is designed to snugly cradle the modem and hold it in place where you need it.

Modem placement with diagrams of the mounting bracket can be found in the Appendix, "Modem Placement" on page 54.

FIGURE 1. PinPoint connecters



Connecting the Antennas

Antennas selected should not exceed a maximum gain of 5 dBi under standard installation configuration. In more complex installations (such as those requiring long lengths of cable and/or multiple connections), it's imperative that the installer follow maximum dBi gain guidelines in accordance with the FFC's, Industry Canada's, or your country's radio communications regulatory body's regulations.

Your AirLink PinPoint will work with most Dual-Band PCS cellular antennas with a TNC connector that works in the high and low frequencies of EDGE/GPRS . Connect the antenna or RF cable directly to the antenna connector on the back of the PinPoint.

Your PinPoint will work with most standard active GPS antennas. Connect the GPS antenna or cable directly to the threaded SMA connector.

Connecting Power

Your PinPoint can be used with either DC (available in most automobiles) or 110 AC (standard US wall power) with the appropriate power adapter (available from AirLink).

The power cable positive lead should be connected to the battery or power source positive terminal. The power cable negative lead should be connected to the battery or power source negative terminal.

Note: When using a DC power source (such as a car battery or solar cell), AirLink recommends placing a fuse (1-2 Amp) on the line close to the power source to protect your power source from possible surges due to shorts or other line issues.

Connecting the PinPoint to a computer or other device

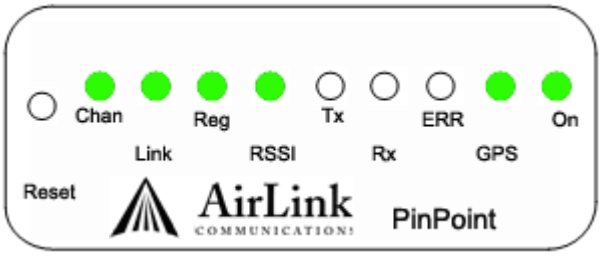
Your PinPoint's serial port can be connected directly to most computers or other devices using a standard straight through cable. If you have a DCE device, you will need a null modem or null modem cable.

Your PinPoint can also be connected to a USB to serial device connected to a computer or other device which does not have an available serial port but does have USB.

PinPoint Indicator Lights

When your PinPoint is connected to power and an antenna, there is a specific pattern to the lights to indicate its operation mode.

FIGURE 2. PinPoint indicator lights



Tx (transmit) and **Rx** (receive) **-** Lights will flash as data is transferred to and from the PinPoint on the remote network.

RSSI(signal level) **-** Light shows the strength of the signal and may be nearly solid (strong signal) or flashing (weaker signal). A slow flash indicates a very weak signal.

Reg (registation) **-** Indicates the PinPoint has acquired an IP from Your Wireless Service Provider.

Chan (channel) - Indicates the modem has acquired a network channel.

Link - Indicates a successful connection to the cellular network.

GPS - Indicates a GPS fix. When lit, the PinPoint has GPS coordinates to report.

Pwr (power) **-** Indicates the power adapter is connected and there is power getting to the modem.

The **Reset** button performs the same function as unplugging power from the modem and plugging it back in. Reset will not alter any saved configuration settings.

Light Patterns

The LEDs on the front of the modem will respond in different patterns to indicate modem states.

- **Normal** - Each LED, mentioned above, lit as applicable.
- **Start up** - The LEDs will cycle from left to right.
- **Low Power** - All LEDs will be off except the power LED which will blink every 3 seconds.
- **Passthru** - The Chan, Reg, and Link LEDs will blink in tandem. The TxRx LED will blink when transmitting or receiving data.
- **SOS** - The Chan and Err or Serv LEDs will blink alternate to each other.

APPENDIX A Mounting

When decided on a location to install your PinPoint, make sure the modem will be away from direct exposure to the elements (sun, rain, etc.). Excess cables can be bundled and tied with twist-ties or other appropriate binders, but the less the cable is wrapped and bound together, the better the modem will perform.

Optional Mounting Kit

An optional accessory for your modem is a mounting kit. The bracket is designed to snugly cradle the modem and hold it in place where you need it.

The PinPoint “snaps” into place in the bracket locking into the grooves on the PinPoint case. The bracket can be further secured with a twist-tie set into the grooves on the top for situations where the PinPoint may be subjected to violent movement, such as in the back of an automobile. In most stationary installations, such as in a field or pipe, the PinPoint and bracket shouldn’t require a twist-tie.

The bracket can be attached to the location using #6 screws (mounting hole diameter approximately 0.150").

FIGURE 1. Mounting Bracket

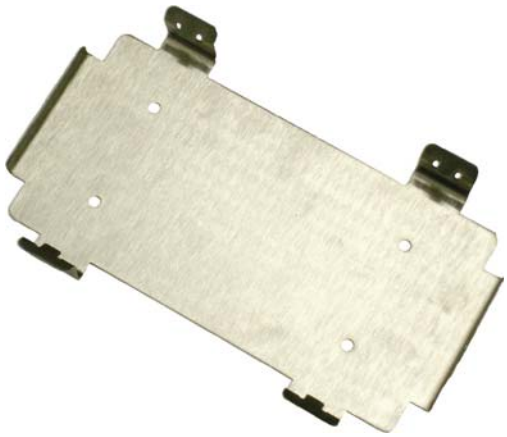
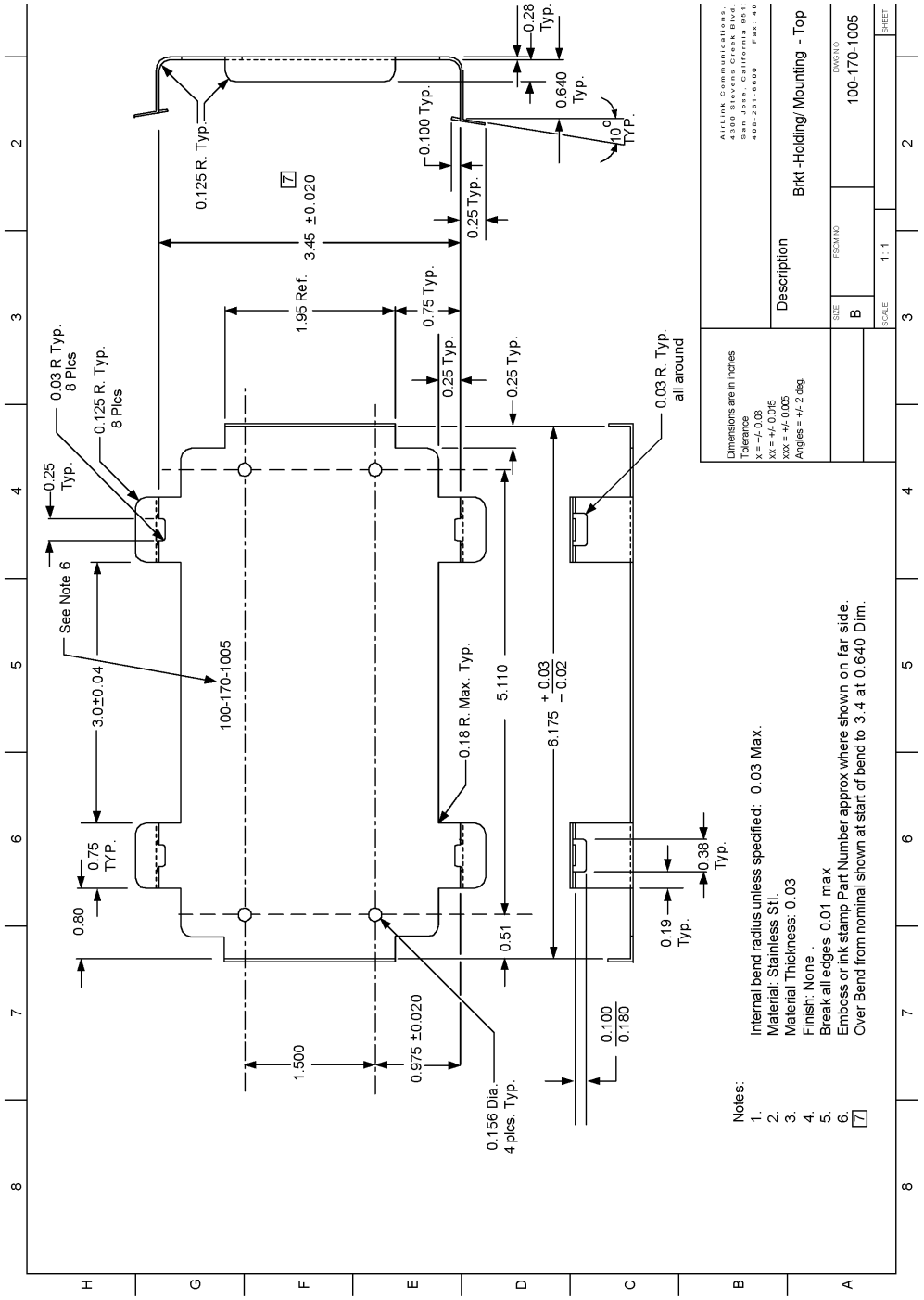


FIGURE 2. PinPoint Mounting Bracket, part number 100-170-1005



GPS Antenna Location

There are three options for an antenna:

- magnetic roof-mount
- through glass-mount
- permanent mount

Mount the GPS Antenna in the vehicle. The less the cable is wrapped and bound together, the better it will perform. Place it on the roof, or on the dash, or rear panel where it has a good view of the sky (greater than a 90 angle view of the sky).

FIGURE 3. GPS Antenna Placement for a Vehicle



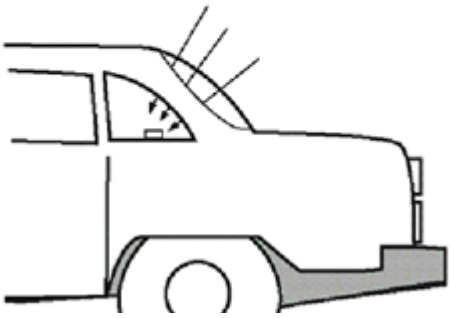
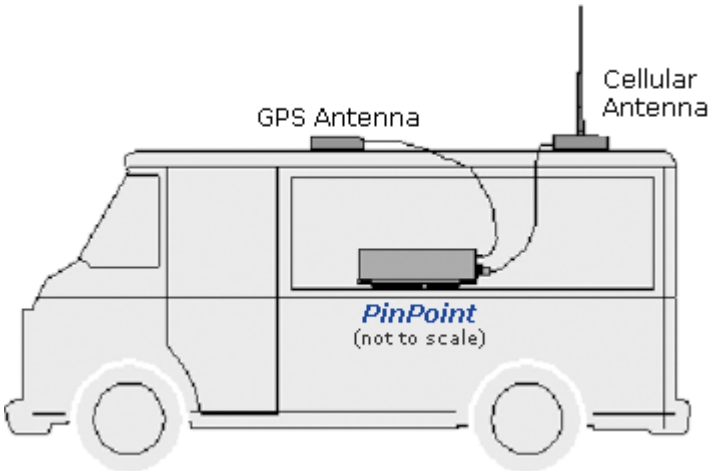


FIGURE 4. PinPoint Placement in a Vehicle



APPENDIX B

EDGE/GPRS

Physical Characteristics:

- Weight: 2 lbs
- Size: 6.8” x 3.3” x 2”
- RF Antenna Connector: 50 Ohm TNC
- GPS Antenna Connector : SMA
- Serial Interface: RS232 DB-9F with 1200-115200 bps (see below for diagram)
- Status LEDs

Data Services & RF Features

- Quad Band GPRS/EDGE (850, 900, 1800 and 1900 MHz)
- EDGE (MS Class 10) w/ GPRS (MS-12) Fallback
- EDGE data rates 236 Kbps maximum, 70-90 typical downlink and 118 maximum, 50-60 typical uplink
- GPRS data rates 7.6 Kbps maximum, 30-50 Kbps typical downlink /uplink
- Coding Schemes 1-9, Full PBCCH Support
- Network: 1900/850 MHz GPRS
- Transmit frequency: 1850-1910 MHz and 824-849 MHz
- Transmit power range at antenna port: 1.0 W for 1900 MHz and 0.8W for 850 MHz
- Transmitter can reduce output power when near a base station as per GSM specifications
- Receiver frequency: 1930-1990 MHz and 869-894 MHz
- Receiver sensitivity: typical -107 dBm (2.439% bit error rate)
- Multislot Class 8

Environmental:

- Operating ranges: -30°C to +°C
- Humidity: 5%-95% Non-condensing

Power Management:

- Advanced Power Management features
- Low power consumption
- Dormant connection (idle for 10-20 seconds): 60 mA at 12 VDC
- Input Voltage: 9 VDC to 28 VDC
- Input Current: 20 mA to 350 mA
- [illegible]DC

	Transmitting
[illegible]	300 mAh

[illegible]e PinPoint and a computer or other serial device needs to be wired straight-[illegible]s to pin 1, pin 2 to pin 2, etc.). If your end device connected to the PinPoint is a [illegible] will need a null-modem cable.

[illegible]: Female DB-9 DCE

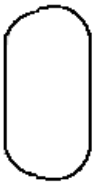


FIGURE 2. Wireless Ace: Tool bar



For more information on using Wireless Ace, please refer to the **Wireless Ace User Guide**.

With Wireless Ace, you can create a template from one modem and then use that template to configure other modems in the exact same way. You can use the template in AceNet, too, to configure several modems at the same time with the same parameters.

FIGURE 3. Wireless Ace: Save / Load a Template

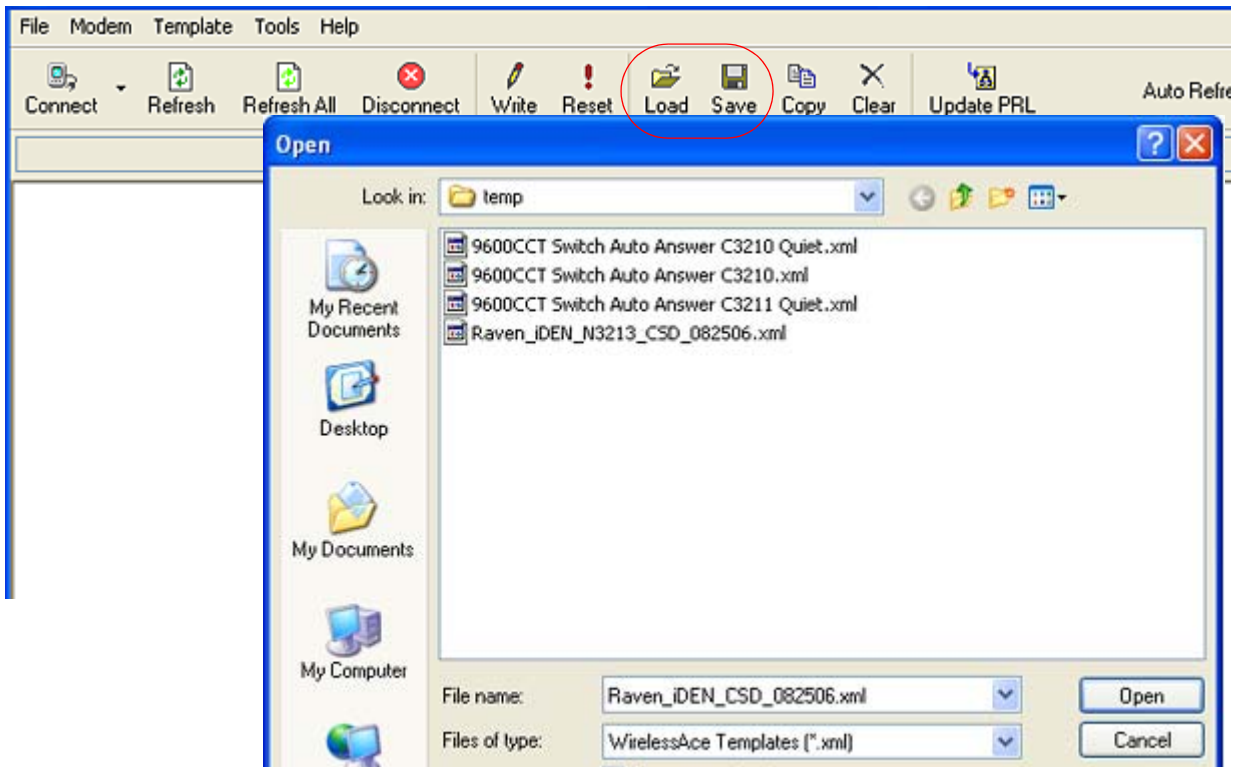
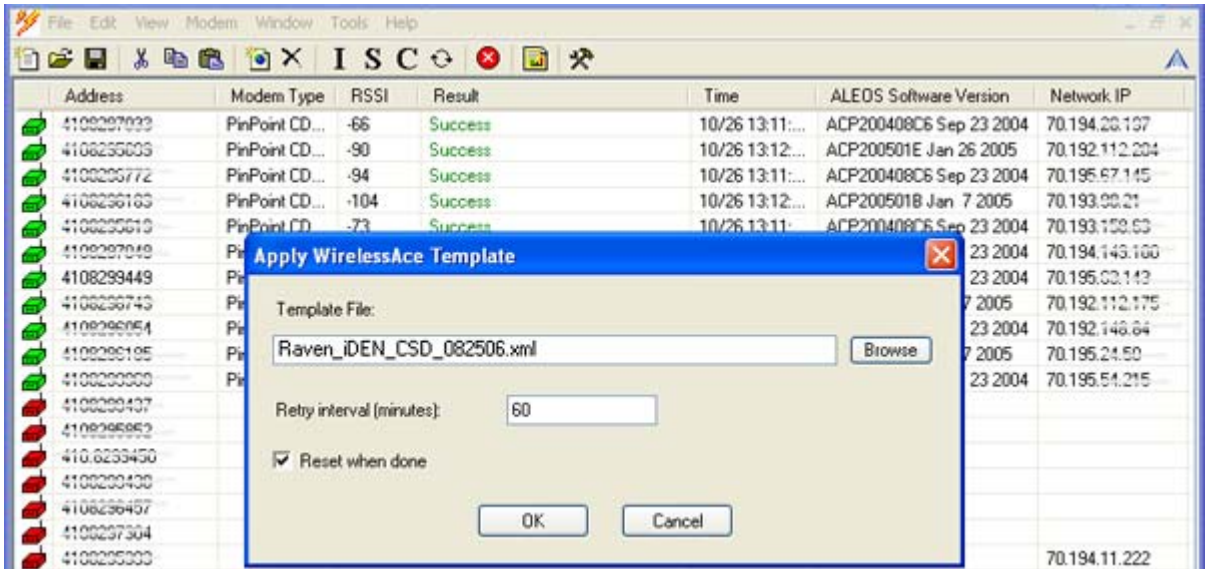


FIGURE 4. AceNet: Load a Template



Using Telnet Terminal Emulation

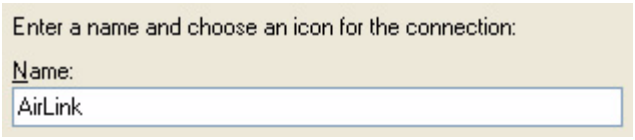
It is possible to communicate with the PinPoint across a TCP/IP network. Telnet provides a terminal style connection to the PinPoint.

Most installations of Microsoft Windows come with a version of HyperTerminal (used here for specific directions), but you can use any other Telnet application, such as Putty, Terra Term, etc.

Start>All Programs>Accessories>Communications>HyperTerminal

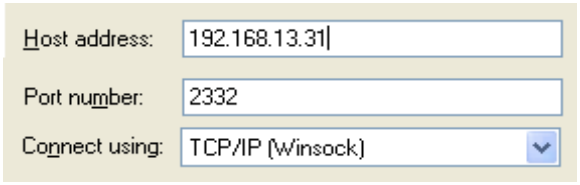
1. Choose a name for your connection, such as **PinPoint** or **AirLink**. The name and icon are only for your own reference so you can find the connection at a later date (if you want to have a connection saved for both local and remote, it is recommended the connection name reflect the connection type (example, PinPoint Remote).

FIGURE 5. HyperTerminal: Connection Name



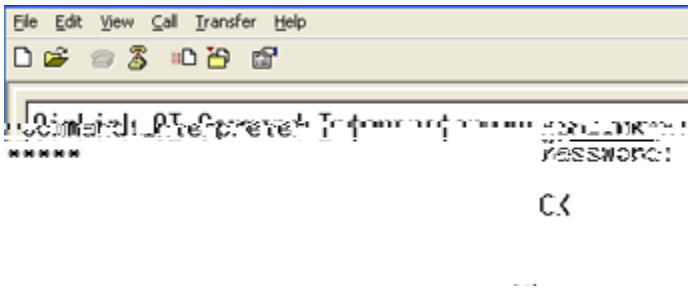
2. Select TCP/IP (Winsock) for **Connect Using**. If the modem is connected directly to your computer's Ethernet port, put in the **host address** of **192.168.13.31** or the *HOSTPEERIP. If the modem is remote, the **host address** will be the current Internet IP of the PinPoint. Change the **port number** to **2332** (default telnet port for the PinPoint).

FIGURE 6. HyperTerminal: TCP/IP Settings



3. When HyperTerminal connects to the PinPoint, you will be prompted for a password. The default password is **12345**. When you press ***Enter***, you should get back a reply of "OK".

FIGURE 7. HyperTerminal: AT mode via Telnet



4. Type **AT** and press ***Enter***. You should get a reply of "OK" or "0".
5. To see what you are typing as you type it, you will need to turn on the echo and verbose mode. Type **ATE1V1** and press ***Enter***.

If you get a reply of "OK", then you entered the command successfully. If you get a reply of "0" or "ERROR", try entering the command again.

Note: You may need to enable Telnet Echo in your terminal emmulation application in order to see the commands you type as you type. In HyperTerminal, select *File > Properties*. Select the *Settings* tab. Click the *ACSII Setup* button. Check *Echo typed characters locally.*

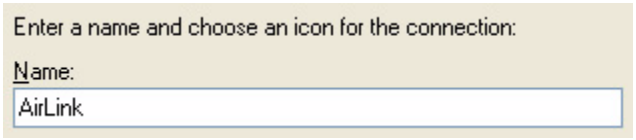
Direct Serial Connection

Using HyperTerminal, included with most installations of Microsoft Windows:

Start>All Programs>Accessories>Communications>HyperTerminal

1. Choose a name for your connection, such as **PinPoint** or **AirLink** (if you want to have a connection saved for both local and remote, it is recommended the connection name reflect the connection type, i.e. PinPoint local). The name and icon are only for your own reference so you can find the connection at a later date.

FIGURE 8. HyperTerminal: Connection Name



2. Select COM1 (or the comport to which the modem is connected) for the **Connect Using**.

FIGURE 9. HyperTerminal: Comport Setting



3. Change the **Bits per Second** to 115200 (default), **Data Bits** to 8, **Parity** to None, **Stop Bits** to 1, and **Flow Control** to Hardware.

Note: If you have configured the PinPoint for settings different than the defaults for Bits per Second, Data Bits, Parity, and/or Stop Bits, you will need to use your changed settings.

FIGURE 10. HyperTerminal: Comport Settings



4. Type **AT** and press ***Enter***. You should get a reply of “OK” or “0”. .
5. To see what you are typing as you type it, you will need to turn on the echo and verbose mode. Type **ATE1V1** and press ***Enter***.

If you get a reply of “OK”, then you entered the command successfully. If you get a reply of “0” or “ERROR”, try entering the command again.

Using AT Commands with a Terminal Application

- The following pages list the AT commands, their parameters, and explain what they do. For most commands, when you are entering them using a terminal connection, you will need to preface the command with **AT** (exceptions are noted), i.e. **ATA** which listed as **A**
- Some commands have specific parameters while other commands will take whatever you type.
- Acceptable parameters and/or specific formats are in the parameters column.

- Required variable parameters are denoted with italicized text, example, D*n*. The *n* is variable and noted in the parameters column.
- Optional parameters are denoted with square brackets [ ].
- Most commands with parameters can be entered with ? to read the current value (for example, **AT&D?** will respond with "2" if the default has not been changed).
- AT Commands are not case sensitive. A capital "E" is the same as a lower-case "e".
- When you are using a terminal connection, if you enter a command which is recognized by the PinPoint, it will respond with "OK". If the command is not recognized, the response will be "ERROR".
- Those commands applicable only to certain model numbers of the PinPoint will be noted.



Caution: Symbols listed with commands, such as *, /, **&**, or **?**, are part of the command and must be included. Commands with symbols other than * may require PassThru mode.



S6 79
S60 83
S7 83
S8 79
S82 86
S83 86
S9 79
T
TCPS 84
TCPT 84
V
V 80
VLTG 100
X
X 80
Z
Z 81

Information and Status

Most of the commands in the “Info” and “Status” groups as well as other groups have read-only parameters. They only provide information and cannot be changed using Wireless Ace (some can be changed using AT Commands with a terminal application).

The commands displayed in Wireless Ace and the results of those commands depends on the model of the modem.

The commands of these two groups are intermingled. The Status Group has more fields that can be displayed on most screens, either resize your screen or use the scroll bar on the side to display the remainder.

Note: Those commands which are not displayed with Wireless Ace may require PassThru mode.

FIGURE 1. Info Group

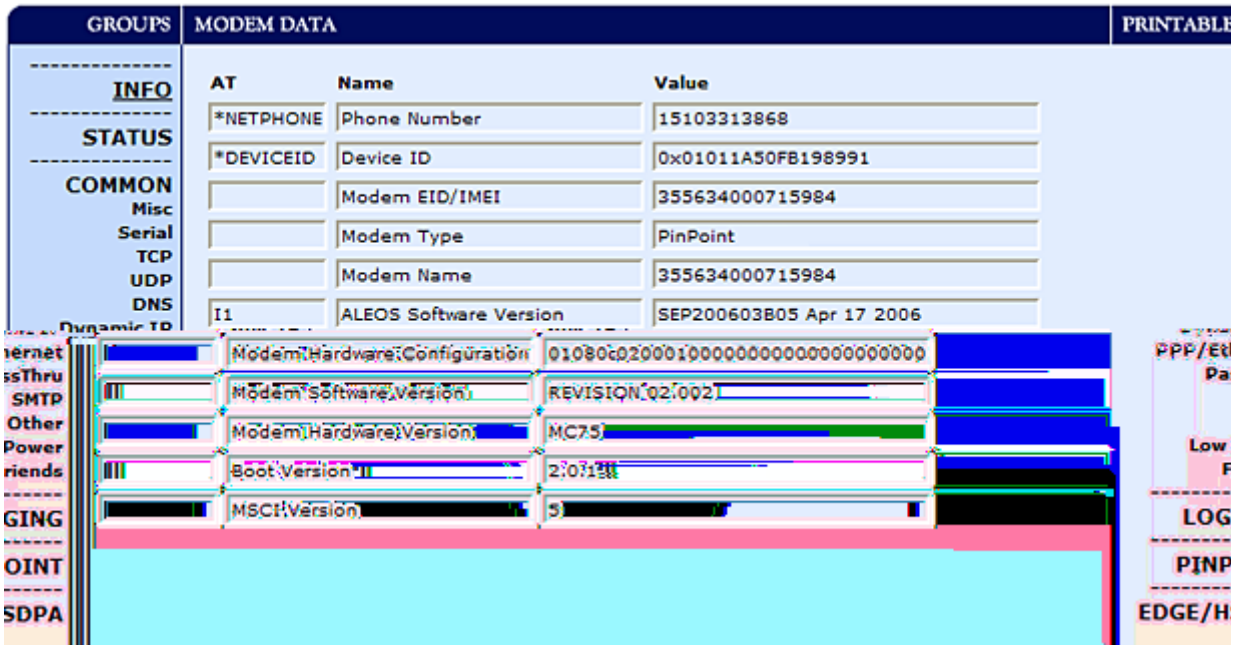
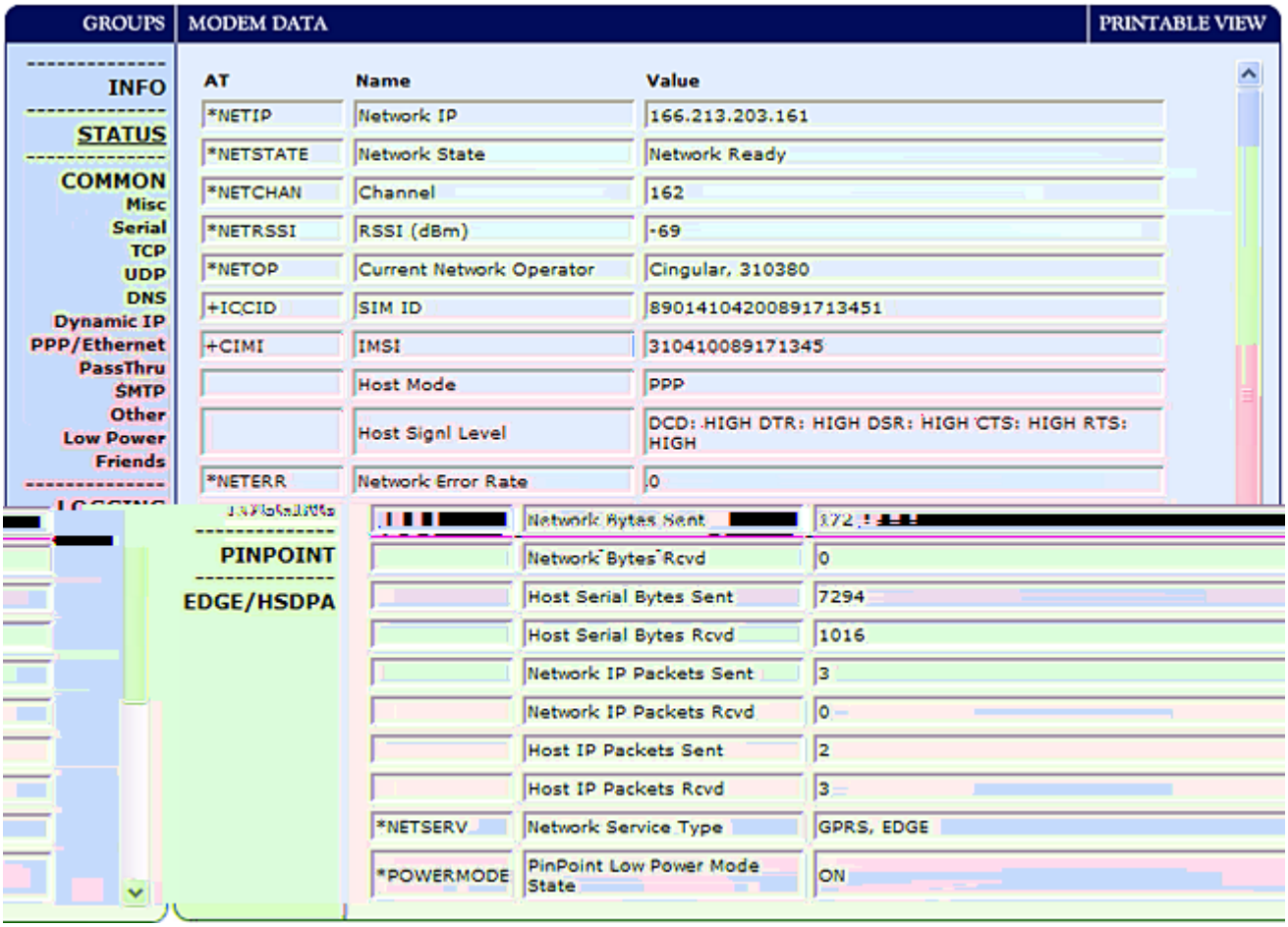


FIGURE 2. **Status Group**



I[*n*]

n=0 Product name (for example, PinPoint Raven-E).

n=1 The PinPoint's firmware (ALEOS) version, hardware ID, and copyright.

n=2 The internal hardware's firmware version and relevant hardware ID.

n=3 The hardware module's unique ID (ESN).

n=5 View active profile (the contents of the active registers).

N=5 is not displayed with Wireless Ace.

*DEVICEID?

The 64-bit device ID the modem uses to identify itself to the cellular network.

*HOSTMODE?

The current host mode (AT, PPP, UDP, etc.). If the PinPoint is not in AT mode, telnet into the modem to execute this command.

*NETERR?

The EDGE or GPRS network bit error rate.

*NETIP?

The current IP address of the modem reported by the embedded OEM module (generally obtained from Your Wireless Service Provider your cellular carrier). This is the address to which packets can be sent in order to contact the PinPoint modem from the Internet.

Use ***NETALLOWZEROIP** if you need to allow the display of an IP ending in a zero .

Note: If there is no current network IP, 0.0.0.0 may be displayed.

*NETOP?

The current cellular carrier (for example, Your Wireless Service Provider) from the modem's firmware version.

*NETPHONE?

The modem's phone number (if applicable or obtainable).

*NETRSSI?

The current RSSI (Receive Signal Strength Indicator) of the PinPoint as a negative dBm value.

The same information is displayed with the command **S202?**.

*NETSERV?

The type of service being used by the modem (for example EDGE/GPRS).

*NETSTATE?

The current network state:

- **Connecting To Network**

  The PinPoint is in the process of trying to connect to the EDGE/GPRS network.

- **Network Authentication Fail**

  Authentication to the EDGE/GPRS network has failed. Verify settings to activate the PinPoint.

- **Data Connection Failed**

  The PinPoint failed to connect, and it is now waiting a set time interval before it attempts to reconnect. Verify settings to activate the PinPoint.

- **Network Negotiation Fail**

  Network connection negotiation failed. This is usually temporary and often clears up during a subsequent attempt.

- **Network Ready**

  The PinPoint is connected to the EDGE/GPRS network and ready to send data.

- **Network Dormant**

  The PinPoint is connected to the EDGE/GPRS network, but the link is dormant. It will be woken up when data is sent or received.

- **No Service**

  There is no EDGE/GPRS network detected.

- **Hardware Reset**

  The hardware module is being reset. This is a temporary state.

*POWERMODE?

Displays the current power state/mode. Possible values returned are:

- **Initial**

  The modem is in the initial 5 minutes since power up, so power down event will be ignored.

- **On**

  Regular power on, a power down is not pending.

- **Low Cancellable**

  Power down is pending but still cancelable if the power down trigger goes away.

- **Low Pending 1 and 2**

  Power down is pending, any modem tasks are gracefully preparing for the power down.

- **Low Final**

  Power down is imminent.

- **Low**

  Power is down.

&V

View active profile (the contents of the active registers).

Not displayed with Wireless Ace.

+CCID

Subscriber Identity Module ID

+CIMI

International Mobile Subscriber Identity

+HWTEMP?

Displays the internal temperature of the radio module in degrees Centigrade.

+ICCID

Subscriber Identity Module ID

+RCIQ

Current Cell Info

Information Displayed in Wireless Ace without AT Commands Listed

- **Bytes and Packets Received and Sent**

  Network traffic for the applicable port.

- **Number of System Resets**

  Counter of the number of system resets over the life of the modem or since the configuration was reset.

- **Bad Password Count**

  Counter of the number of bad password attempts.

- **IP Reject Count or Log**

  Rejected IP Data.

- **Versions of ALEOS, internal hardware, boot, and MSCI**

  Versions of internally configured hardware and software.

- **GPS information**

  Number of satellites, GPS Fix (0 = No Fix, 1 = GPS Fix, 2 = WAAS), latitude, and longitude.

GPS Status and Map Link

In Wireless Ace, next to the displayed information of the Latitude and Longitude, there is a link to an external map which will visually place the co-ordinates. When you click the map link, it will open your default web browser with the map location highlighted.

FIGURE 3. Wireless Ace: Map Link

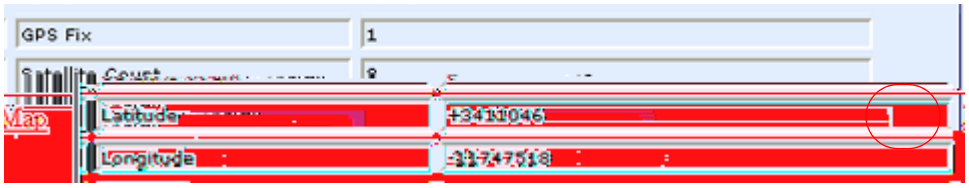
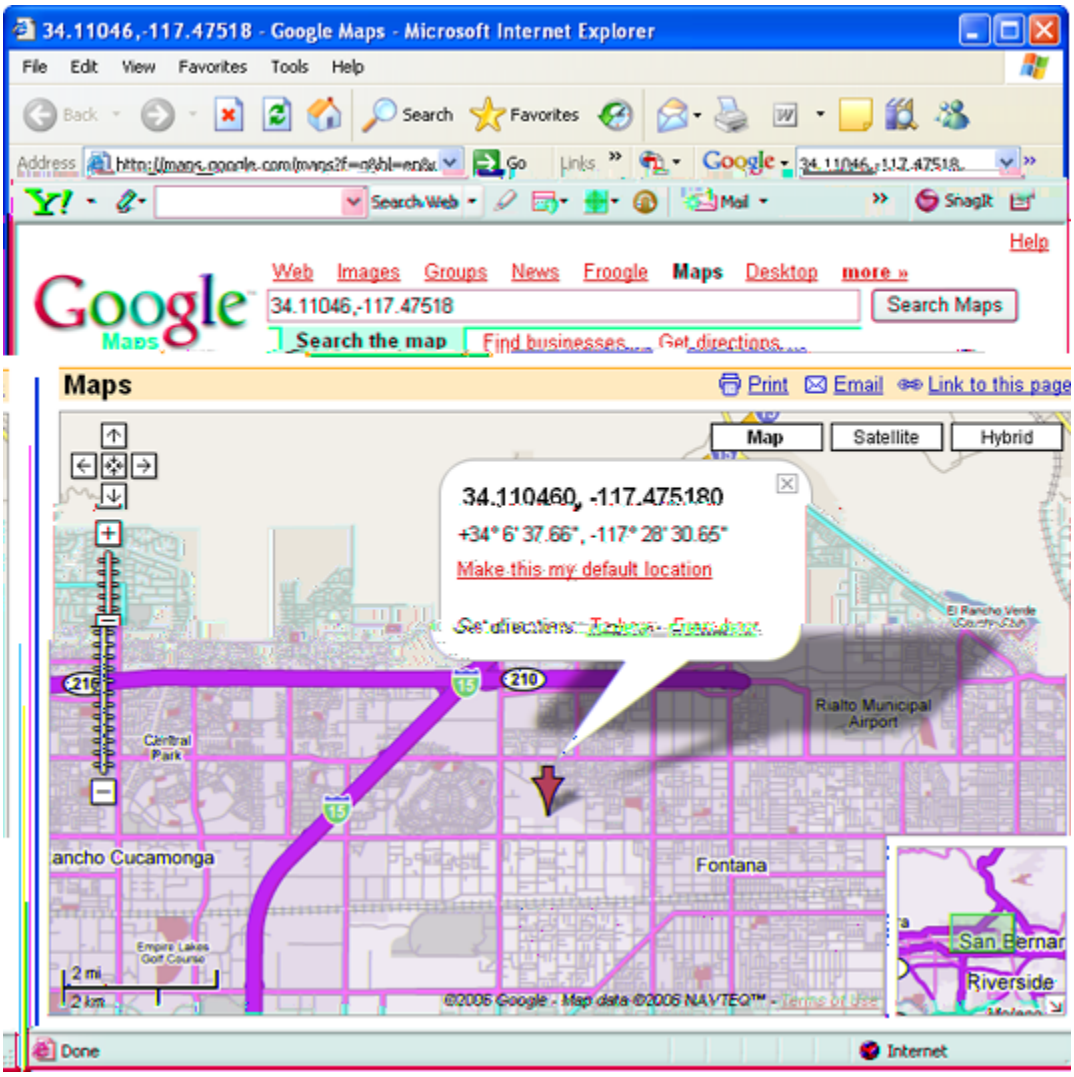


FIGURE 4. Map View



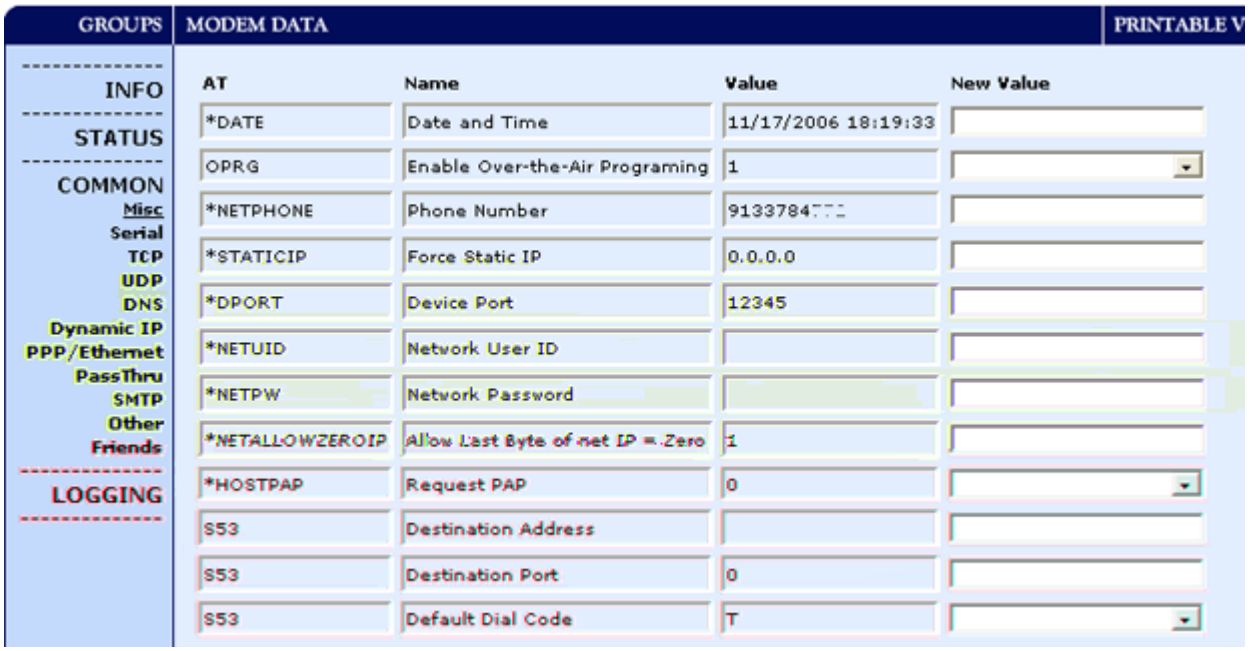
Note: The map feature will only work if you have access to the Internet on your computer either through the modem or seperate from the modem.

Misc (Miscellaneous)

This group includes configuration commands which are not specific to other groups.

The commands displayed in Wireless Ace and the results of those commands depends on the model of the modem.

FIGURE 1. Common : Misc



OPRG=*n*

Enables/disables over-the-air firmware upgrading of the PinPoint.

When AirLink releases a new verison of ALEOS, you can upgrade your remote modems with OPRG enabled.

n=**0 :** Disables

n=**1:** Enables

S53=*[method][d.d.d.d][/ppppp]*

Destination IP address, port, and method. These are used as defaults for the D (Dial) AT command.

method= **P :** UDP

method=**T :** TCP

method=**N :** Telnet

d.d.d.d=IP address or name

ppppp=the port address

Examples:

ATS53=T192.168.100.23/12345

ATS53=foo.earlink.com

Telnet to the specified IP at port 12345.

ATS53=192.168.100.23/12345

Query the specified IP at port 12345.

ATS53=/12345

Query port 12345.

DATE=[mm/dd/yyyy],[hh:mm:ss]*

Sets and queries the clock in the unit. Either the date and time can be specified, or simply one of the two can be specified in which case the unspecified value will remain unchanged. The date and time are always specified 24-hour notation.

mm/dd/yyyy = month, day, year

hh:mm:ss = time in 24-hour notation

Note: The GPS will be used to set the time, in which case any date/time specified by this command will be ignored.

*DPORT=*n*

The modem's Device Port which the modem is listening on for inbound packets/data/polls.. Can also be set with the command **S110**.

n=1-65535

*HOSTPAP=*n*

Use PAP to request the user login and password during PPP negotiation on the host connection.

n=**0 :** Disable PAP request (Default).

n=**1 :** Takes user login and password from Windows DUN connection and copies to *NETUID and *NETPW.

*NETALLOWZEROIP=*n*

Allows the displayed IP address in *NETIP to end in zero (ex. 192.168.1.0).

n=**0 :** Do not allow

n=**1 :** Allow

*NETPW=*pw*

The password that is used to login to Your Wireless Service Provider's cellular network, when required.

pw=password

*NETPHONE?

The modem's phone number, if applicable or obtainable.

*NETUID=*uid*

The login that is used to login to Your Wireless Service Provider's cellular network, when required.

uid=user id (up to 64 bytes)

*STATICIP=*d.d.d.d*

Set the static IP required to be received from the network. If the modem does not get this IP address from the network, it will reset the internal hardware and try again. The default is 0.0.0.0, which allows any IP address from the network.

d.d.d.d=IP address

Example: **AT*STATICIP=192.168.1.23**

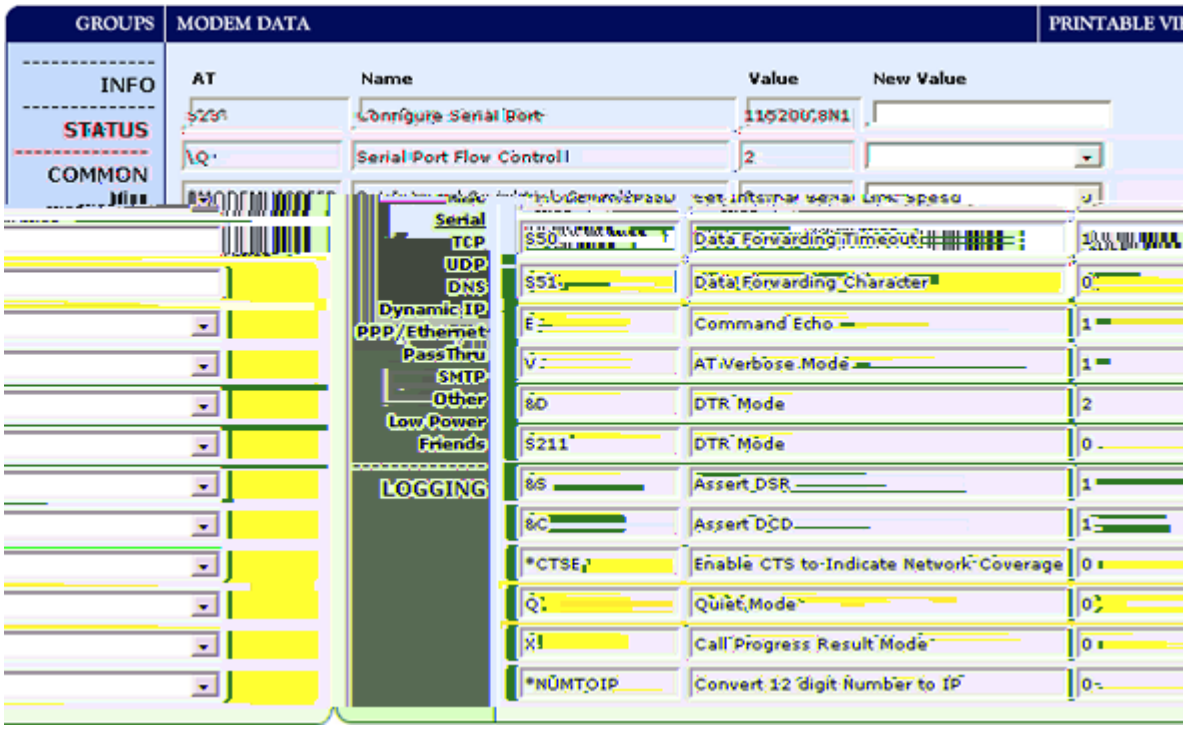
Caution: *STATICIP does not set the IP address of the modem, it merely tells the modem which IP address to expect. If the expected IP address is not granted while registering on the cellular network, the modem will try to register on the network again until it receives that IP address. If your account is set up for a dynamic IP address and you set an address for *STATICIP, you may not be able to register on the network at all since there is no guarentee you will receive the same dynamic IP address again.

Serial

This group includes commands specific to the serial port.

The commands displayed in Wireless Ace and the results of those commands depends on the model of the modem. Some of the commands in this section, as noted, are not available in Wireless Ace. Many of the commands not available with Wireless Ace require PassThru mode to use.

FIGURE 1. Common : Serial



+++

Note: This command is not proceeded by AT nor does it require a carriage return (enter).
There must be an idle time (set by **S50**) on the serial port before and after this command.

The "+" is ASCII 0x2B.

AT Escape sequence.

If the PinPoint is in a data mode (any mode other than PassThru), this command causes the modem to re-enter AT command mode.

Cannot be configured in Wireless Ace.

Note: This command does nothing if DAE=1.

A/



Note: This command is not proceeded by AT.

Re-execute last command.

Cannot be configured in Wireless Ace.

A

Manually answer an incoming connection.

Cannot be configured in Wireless Ace.

D*[method][d.d.d.d][/ppppp]* or D*[method][@name][/ppppp]*

Dial a connection to a remote IP and Port using *method*.

Cannot be configured in Wireless Ace.

method=**P :** Establish a UDP connection

method=**T :** Establish a TCP connection

method=**N :** Establish a Telnet connection

d.d.d.d=IP address to contact

ppppp=IP port to contact

Examples:

ATD - Dial (establish) default connection.

ATDP192.168.13.31/2332 - Dial (establish) UDP session to 192.168.13.31, at port 2332.

To end the connection, issue the **+++** escape sequence or drop the DTR line (if Ignore DTR **S211=0** or **&D2**).

The defualt connetion is set in **S53.**

If a domain name is specified, the '@' symbol can be used to explicitly indicate the start of the name. For example, if **ATDPHONY** is issued, this will be interpreted as dial a UDP connection to “HONY”. To dial using the default method to host “PHONY”, one would issue **ATD@PHONY**. .

If the method, IP address, or port is omitted, the values from **S53** are used. If a telnet connection is requested (N) and the port is not supplied, port 23 will be used instead of the value from **S53**.

Several special dialing numbers exist to make it easy to establish a PPP or SLIP connection with the modem. **ATD#19788** or **ATDT#19788** will establish a PPP connection (see \APPP) and **ATDT#7547** will establish a SLIP connection (see \ASLIP).



Note: The source port of the session is the Device Port (set by **S110** or ***DPORT**).

DS=*n*

Allows a PPP connection to be initiated on the host port.

n=**2 :** Initiates the PPP connection.

Cannot be configured in Wireless Ace.

E*n*

Toggle AT command echo mode.

n=**0 :** Echo Off

n=**1 :** Echo On

H*n*

Hang-Up Command.

n=**1:** Hang-up

With an AT telnet connection, this command will terminate the host data mode and return the PinPoint to an AT mode.

Cannot be configured in Wireless Ace.

Q*n*

The AT quiet-mode setting. If quiet mode is set, there will be no responses to AT commands except for data queried.

n=**0 :** Off (Default)

n=**1 :** Quiet-mode on

S3=*n*

Carriage Return Character

n=**0-127** (ASCII character number)

The standard end of line character used to indicate the end of an AT command. This character is also used as the carriage return character for framing responses and result codes in command state.

Cannot be configured in Wireless Ace.

S4=*n*

Line Feed Character

n=**0-127** (ASCII character number)

The standard line feed character sent by the modem to the host at the end of a response or return code in command state.

Cannot be configured in Wireless Ace.

S5=*n*

Backspace Character

n=**0-127** (ASCII character number)

This register sets the character recognized as a backspace during command entry.

Cannot be configured in Wireless Ace.

S6=*n*

Wait for Blind Dial

n=**2-10** seconds

This register denotes the wait time, in seconds, before a blind dial (no dial tone detection).

Cannot be configured in Wireless Ace.

S8=*n*

Comma Pause Time (Dial Modifier)

***n*=0-255**

Whenever a dial command contains the comma character, the contents of this register specify the pause time for each comma.

Cannot be configured in Wireless Ace.

S9=*n*

Carrier Detect Response Time

***n*=0-255**

Specifies the time that the received carrier must be present for the modem to recognize it and turn on Data Carrier Detect (DCD) if applicable. The implementation is entirely at the IWF modem.

Cannot be configured in Wireless Ace.

S10=*n*

Lost Carrier Hang-up Delay (Remote)

***n*=1-2545**

Specifies the amount of time that the carrier from the remote modem can be lost before the modem goes on-hook. This allows temporary disruptions to carrier without disconnecting.

A setting of 255 causes the modem to disable Carrier Detect and presume carrier is always present.

Cannot be configured in Wireless Ace.

S23=*[speed],[databits][parity][stop bits]*

Serial line parameters. The settings take affect after reset.

speed=300 | 1200 | 2400 | 4800 | 9600 | 19200 | 38400 | 57600 | 115200 | 230400

databits=**7** or **8**

parity=**O :** Odd

parity=**E :** Even

parity=**N :** None

parity=**M:** Mark

stopbits=1 | 1.5 | 2

Example: **ATS23=19200,8N1** (sets modem to 19200, etc.)

Can also be set using **&L**=[*speed*],[*databits*] [*parity*][*stop bits*]



Note: Databits MUST be 8 data bits for PPP mode.

S50=*n*

Data forwarding idle time-out. If set to 0, a forwarding time-out of 10ms is used.

n=tenths of seconds

Used in UDP or TCP PAD mode.

S51=*n*

PAD data forwarding character.

n=ASCII code of character that will cause data to be forwarded.

n=**0 :** No forwarding character.

Used in UDP or TCP PAD mode.

S211=*n*

For applications or situations where hardware control of the DTR signal is not possible, the modem can be configured to ignore DTR. When Ignore DTR is enabled, the modem operates as if the DTR signal is always asserted.

n=**0 :** Use hardware DTR. (default).

n=**1 :** Ignore DTR.

n=**3 :** Ignore DTR and assert DSR. This value is deprecated, and it is recommended to use &S to control the DSR instead. When this value is set to 3, &S will automatically be set to 0. **See also:** &D and &S.

V*n*

Command Response Mode.

n=**0 :** Terse (numeric) command responses

n=**1 :** Verbose command responses (Default).

X*n*

Extended Call Progress Result mode.

n=**0 :** Turn off extended result codes (Default).

n=**1 :** Turn on result codes. This adds the text 19200 to the CONNECT response.

Z

Reset the PinPoint.

In Wireless Ace, this command is performed with the Reset option on the toolbar.

Note: This command does nothing if *DATZ=1.

&C*n*

Set DCD mode.

n=**0 :** Always assert DCD.

n=**1 :** Assert DCD when in a data mode (UDP, TCP, PPP, or SLIP) (Default).

n=**2 :** Assert DCD when the modem has network coverage.

&D*n*

Set DTR mode.

n=**0 :** Ignore DTR, same effect as HW DTR always asserted (same as S211=1).

n=**2 :** Use hardware DTR (same as S211=0).

&S*n*

Set DSR mode.

n=**0 :** Always assert DSR.

n=**1 :** Assert DSR when in a data mode (UDP, TCP, PPP, or SLIP) (Default).

n=**2 :** Assert DSR when the modem has network coverage.

Note: S211 can also be used to request that DSR is always asserted. If **S211** is set to **3** and **&S** is changed to a **non-zero** value, **S211** will be changed to **1**.

&W

Writes all changed modem settings. If this command is not issued, any modified values will revert back to their previous values at modem reset.

Cannot be configured in Wireless Ace.

\APPP

Set modem operation to PPP mode.

Cannot be configured in Wireless Ace.

\ASLIP

Set modem operation to SLIP mode. DTR must be asserted (**&D0** or **S211=1**).

Cannot be configured in Wireless Ace.

\Q

Set or query the serial port flow control setting.

n=**0 :** No flow control is being used.

n=**1 :** RTS/CTS hardware flow control is being used.

n=**4:** Transparent software flow control. Uses escaped XON and XOFF for flow control. XON and XOFF characters in data stream are escaped with the @ character (0x40). @ in data is sent as @@.

*CTSE=*n*

Clear To Send Enable: This feature asserts CTS when there is a network connection.

n=**0 :** Disabled (Default).

n=**1 :** Enable assertion of CTS when there is network coverage.

RS232 voltage levels:

Positive = Network coverage.

Negative = No coverage.



Note: Flow control (**AT\Q**) will override this indication, so if you want to use CTS to indicate network coverage, flow control has to be off (**AT\Q0**).

*MODEMHISPEED

Set the internal serial link speed to the radio (modem) module.

May not be available for all modem models.

*NUMTOIP=*n*

Convert 12 digit number to IP.

n=**0 :** Use as name.

n=**1 :** Use as IP address.

*PPPNOCARRIER=*n*

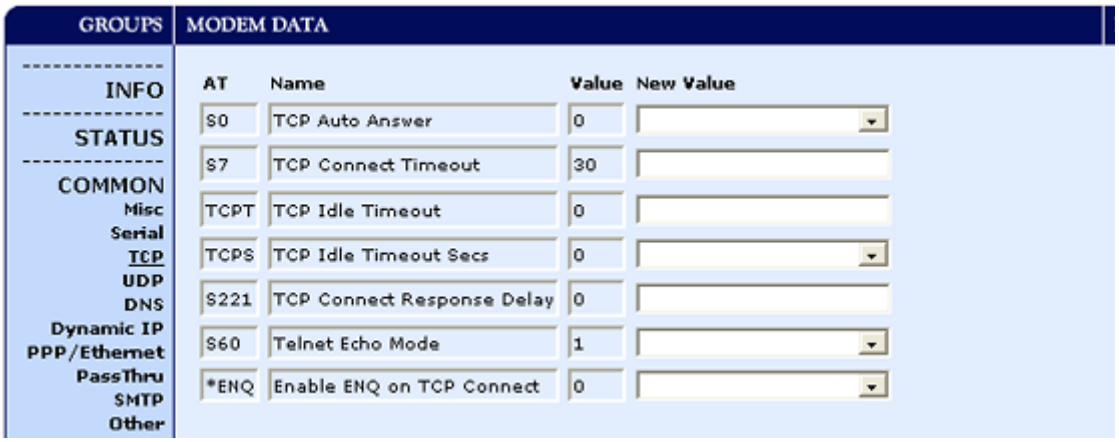
n=**0 :**

n=**1** :

TCP

This group includes commands specific to TCP communications.

FIGURE 1. Common : TCP



S0=*n*

This register determines how the PinPoint responds to an incoming TCP connection request. The PinPoint remains in AT Command mode until a connection request is received. DTR must be asserted (**S211=1** or **&D0**) and the PinPoint must be set for a successful TCP connection. The PinPoint will send a “RING” string to the host. A “CONNECT” sent to the host indicates acknowledgement of the connection request and the TCP session is established.

n=**0 :** Off (Default)

n=**1 :** On

n=**2 :** Use Telnet server mode on TCP connections.

n=**3 :** With a Telnet connection, overrides the client's default echo, allowing the server on the host port to pec67 2 the echo. CRLF sequences from the telnet client will also be edited to simply pass CRs to the server on the host port.

S7=*n*

Specifies the number of seconds to wait for a TCP connection to be established when dialing out.

n=seconds

S60=*n*

Telnet Client Echo Mode.

n=**0 :** No Echo

n=**1 :** Local Echo (Default)

n=**2 :** Remote Echo

S221=*n*

Connect Delay:

***n*= 0 - 255**

Number of seconds to delay the “CONNECT' response upon establishing a TCP connection.

OR

Number of tenths of seconds to delay before outputting ENQ on the serial port after the CONNECT when the ENQ feature is enabled (see *ENQ).

TCPS=*n*

TCP connection time-out (TCPS) units. Specifies a time interval upon which if there is no in or outbound traffic through a TCP connection, the connection will be terminated.

n=minutes (TCPS=0) or seconds (TCPS=1)

TCPT=*n*

TCP connection time-out (TCPT) units. Specifies a time interval upon which if there is no in or outbound traffic through a TCP connection, the connection will be terminated.

n=minutes (TCPT=0) or seconds (TCPT=1)



Note: This value only affects the TCP connection in TCP PAD mode.

*ENQ=*n*

Outputs an ENQ [0x05] after the TCP CONNECT delayed by the Delay Connect Response time (**S221**).

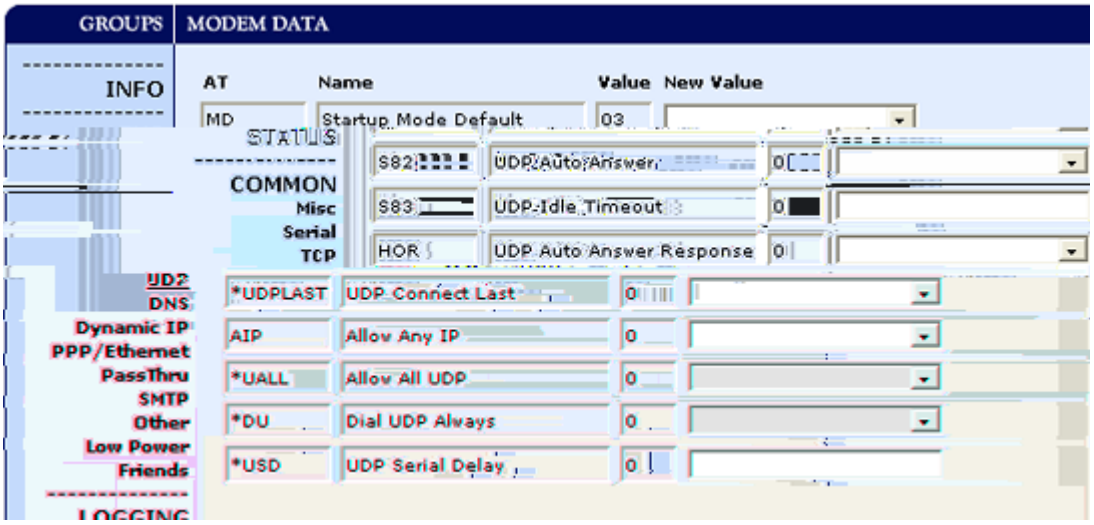
n=**0 :** Disabled (Default).

n=**1 :** Enables ENQ on CONNECT.

UDP

This group includes commands specific to UDP communications.

FIGURE 1. Common : UDP



AIP=*n*

Allow IP address.

n=**0** Allow only the IP address specified in **S53** to connect when UDP auto answer is enabled (**S82=2**).

n=**1** Allow any incoming IP address to connect when UDP auto answer is enabled (**S82=2**).

Note: Always subject to any Friends filters that may be defined.

HOR=*n*

Half-Open Response - In UDP auto answer (half-open) mode:

n=**0** No response codes when UDP session is initiated.

n=**1** RING CONNECT response codes sent out serial link before the data from the first UDP packet.

Note: Quiet Mode must be Off.

MD*hh*

Default power-up mode for the serial port.

When the PinPoint is power-cycled, the serial port enters the mode specified by this command after 5 seconds. On startup, typing ATMD0 within 5 seconds changes the mode to normal (AT command) mode.

hh (hex byte)=**00** : normal mode

hh=**01 :** SLIP mode

hh=**02 :** PPP mode

hh=**03 :** UDP mode

hh=**04 :** TCP mode

hh=**07 :** PassThru mode

hh=**0F :** PinPoint MDT

hh=**13 :** Modbus ASCII

hh=**23 :** Modbus RTU (Binary)

hh=**33 :** BSAP

hh=**63 :** Variable Modbus

hh=**73 :** Reliable UDP

hh=**83 :** UDP Multicast

See also **S53** to set the port for UDP or TCP.

S82=*n*

Enables UDP auto answer (half-open) mode.

n=**0 :** Normal mode

n=**2 :** Enable UDP auto answer mode.

S83=*n*

Set or query UDP auto answer idle time-out. If no data is sent or received before the time-out occurs, the current UDP session will be terminated. While a session is active, packets from other IP addresses will be discarded (unless *UALL is set).

n=**1 - 255** Time-out in seconds.

n=**0 :** No idle time-out (Default).

*DU=*n*

The dial command always uses UDP, even when using ATDT.

n=**0 :** Dial using the means specified (default).

n=**1 :** Dial UDP always, even when using ATDT.



Note: When this parameter is set you cannot establish a TCP PAD connection.

*UALL=*n*

Accepts UDP packets from any IP address when a UDP session is active. If there is no UDP session active, an incoming UDP packet will be treated according to the UDP auto answer and AIP settings.

n=**0 :** No effect (Default).

n=**1 :** Accept UDP data from all IP addresses when in a UDP session.

*UDPLAST=*n*

If enabled, sets **S53** to the last accepted IP address through UDP auto answer. This can be used in conjunction with **MD3** so that when there is no UDP session, new ethernet host data will cause a connection to be restored to the last IP accepted through UDP auto answer. .

n=**0 :** Does not change **S53** setting. (Default).

n=**1 :** Set **S53** to the last accepted IP.



Note: This does not change the **S53** setting in NVRAM. If the modem is reset, the original **S53** setting will be restored from NVRAM.

*USD=*n*

Waits the specified delay before sending the first UDP packet and the subsequent UDP packets out to the serial port.

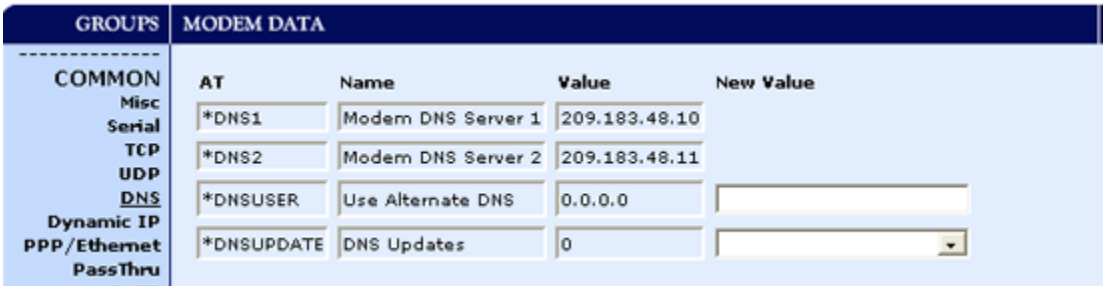
n=**1 - 255** Delay in 100ms units, from 100 ms to 25.5 sec.

n=**0 :** No UDP packet delay (Default).

DNS

This group includes commands specific to the modem being able to use domain names instead of IP addresses for other configuration options.

FIGURE 1. Common : DNS



*DNS*n*

Queries the DNS addresses. Your Wireless Service Provider provides the DNS addresses while your modem is registring on their network.

n=**1** *or* **2** First and second DNS address.

d.d.d.d = IP of domain server

*DNSUPDATE=*n*

Indicates whether the modem should send DNS updates to the DNS server specified by *DNSUSER. These updates are as per RFC2136. They are not secure and are recommended only for a private network. In a public network, the IP Logger services should be used instead.

n=**0 :** DNS updates disabled (Default).

n=**1 :** DNS updates enabled.

*DNSUSER=*d.d.d.d*

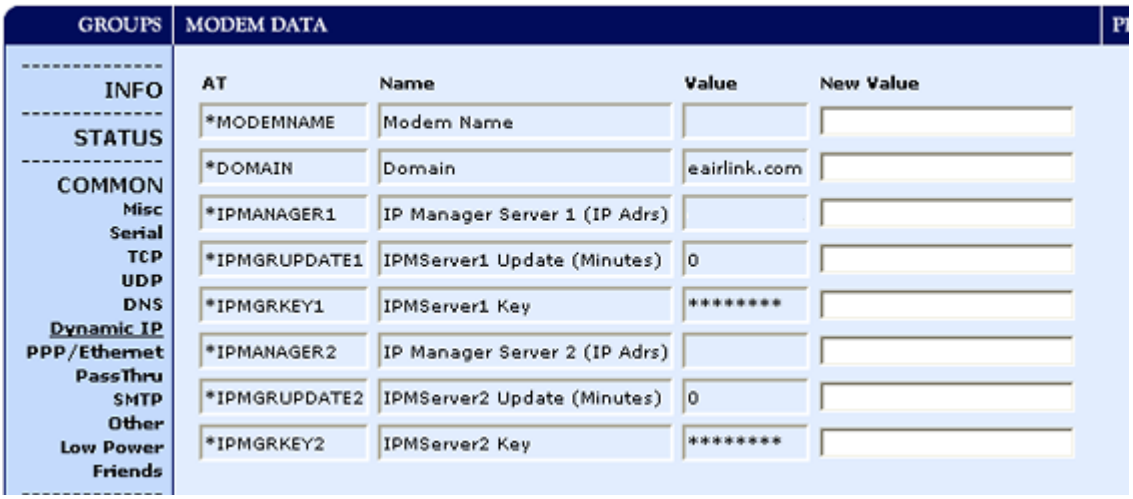
Sets a user-provided DNS to query first when performing name resolutions in the modem.

d.d.d.d = IP of domain server

Dynamic IP

This group includes commands specific to dynamic DNS. Dynamic DNS allows the PinPoint to use a dynamic IP (can change each time you connect) account but still allow you to use a fully qualified domain name to contact the PinPoint using IP Manager (page 14) running on a server with a dynamic DNS updater.

FIGURE 1. Common : Dynamic IP



DOMAIN=[name]*

Domain (or domain zone) of which the PinPoint is a part. This value is used during name resolutions if a fully qualified name is not provided and also for DNS updates. This value can be up to 20 characters long.

name = domain name (i.e. eairlink.com)

If ***DOMAIN=eairlink.com**, then when ATDT@remote1 is entered, the fully qualified name remote1.eairlink.com will be used to perform a DNS query to resolve the name to an IP address.

Note: Only letters, numbers, hyphens, and periods can be used in a domain name.

*IPMANAGER*n*=*[name]*

Sets a domain name or IP address to send IP change notifications to. Up to two independent IP Manager servers can be set, using either AT*IPMANAGER1 or AT*IPMANAGER2. Updates to a server can be disabled by setting that entry to nothing (for example, “AT*IPMANAGER1=”).

n=**1 :** First IP Manager server.

n=**2 :** Second IP Manager server.

name = domain name

*IPMGRKEY*n*=*[key]*

Sets the 128-bit key to use to authenticate the IP update notifications. If the key's value is all zeros, a default key will be used. If all the bytes in the key are set to FF, then no key will be used (i.e. the IP change notifications will not be authenticated). AT*IPMGRKEY1 is used to set the key to use with AT*IPMANAGER1, while AT*IPMGRKEY2 is used to the key with AT*IPMANAGER2.

n=**1 :** First IP Manager server.

n=**2 :** Second IP Manager server.

key=128-bit key in hexadecimal [32 hex characters]

*IPMGRUPDATE*n*=*m*

Sets the number of minutes to periodically send an IP update notification to the corresponding server. This will occur even if the IP address of the PinPoint doesn't change. *IPMGRUPDATE1 is used to set the refresh rate to *IPMANAGER1, while *IPMGRUPDATE2 is used with *IPMANAGER2.

n=**1 :** First IP Manager server.

n=**2 :** Second IP Manager server.

m=0, 5-255 Number of minutes to send an update.

If the value is set to 0, then periodic updates will not be issued (i.e. IP change notifications will only be sent when the IP actually changes).

MODEMNAME=[name]*

Name of the PinPoint (up to 20 characters long) to use when performing IP address change notifications to IP Manager. The value in *DOMAIN provides the domain zone to add to this name.

name = domain name (i.e. eairlink.com)

Example: if ***MODEMNAME=mymodem** and ***DOMAIN=eairlink.com**, then the modem's fully qualified domain name is **mymodem.eairlink.com**.

Automatically Generated Names:

- **#I3** - The ESN/IMEI will be used as the name.
- **#NETPHONE** - The phone number will be used as the name.

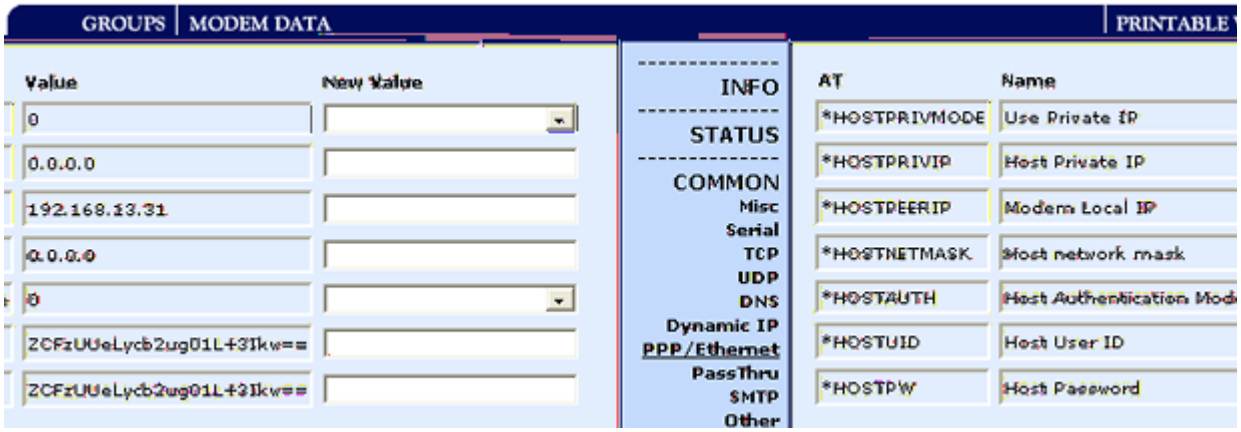


Note: Each modem using IP Manager needs a unique name. Two modems cannot be called “mymodem”. One could be “mymodem1” with the other as “mymodem”.

PPP/Ethernet

This group includes commands specific to PPP or Ethernet connections between the PinPoint and a connected device.

FIGURE 1. Common : PPP/Ethernet



*HOSTAUTH=*n*

Host Authentication Mode: Use PAP or CHAP to request the user login and password during PPP or CHAP negotiation on the host connection. The username and password set in *HOSTUID and *HOSTPW will be used.

n=**0 :** Disable PAP or CHAP request (Default).

n=**1 :** PAP and CHAP.

n=**2 :** CHAP

*HOSTNETMASK=*n.n.n.n*

Subnet mask for the host interface. Allows communication with a subnet behind the host interface.

n.n.n.n = subnet mask, example 255.255.255.0

*HOSTPEERIP=*d.d.d.d*

Set or query the IP address that can be used to directly contact the PinPoint once a EDGE/GPRS connection is established. If this value is not specified, 192.168.13.31 will be used.

d.d.d.d=local or peer IP of modem

Note: This is not normally used nor needed by user applications.

*HOSTPRIVIP=*d.d.d.d*

Set or query the private IP address that is to be negotiated by the EDGE/GPRS connection if *HOSTPRIVMODE =1.

d.d.d.d=IP Address

*HOSTPRIVMODE=*n*

Set or query whether a private or public (network) IP is to be used when the Host initiates a EDGE/GPRS connection to the modem.

n=**0 :** Public (network) IP Mode: When the Host initiates a PPP connection, the host will be given the network IP address that was obtained from Your Wireless Service Provider while registering on the network. If the network issues a new IP address, the EDGE/GPRS connection will be closed (since the IP address has changed) and has to be re-initiated. (default).

n=**1 :** Private IP Mode: When the Host initiates a EDGE/GPRS connection, the host will be given the IP address specified in *HOSTPRIVIP. The modem will then perform 1 to 1 NAT-like address translation, which shields the Host from network IP changes.

*HOSTPW=*string*

Host Password forPAP or CHAP.

string=password

*HOSTUID=*string*

Host User ID forPAP or CHAP.

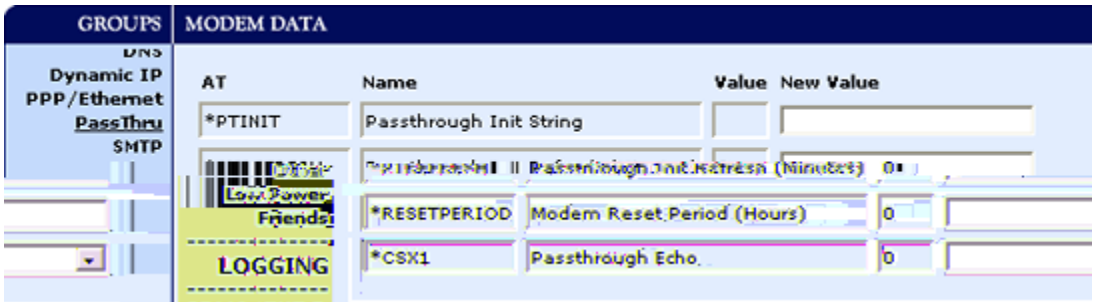
string=user id (up to 64 bytes)

PassThru

PassThru Mode is used to communicate directly to the PinPoint's internal hardware.

Caution: While the modem is in PassThru mode, ALEOS is disabled. If you need to connect to the PinPoint while it is in PassThru mode, you will need to do so with a terminal application. Not all commands are available while the modem is in PassThru mode.

FIGURE 1. Common : PassThru



*CSX1=*n*

n=**0 :** Data will be passed to the host.

n=**1 :** PASSTHRU mode will echo all host received data and will not pass the data to the modem while the modem is not asserting DCD.

Note: If the modem is asserting DCD, data will be passed from the host to the modem as it normally is when ***CSX1=0**.

*PTINIT=*string*

Any AT Command string to be passed to the OEM module before entering PASSTHRU mode, e.g. AT&S1V1, etc.

string=AT command(s)

*PTREFRESH=*n*

Number of minutes of inactivity in PASSTHRU mode to resend the *PTINIT string to the hardware module.

n=**1-255** minutes

n=**0 :** Disabled

*RESETPERIOD=*n*

In PASSTHRU mode, modem will be reset after this period if no data has been sent or received. Value is in hours.

n=**1-255** hours

n=**0 :** Disabled

\APASSTHRU



Caution: This mode is not available through the remote AT telnet server. You will need to connect to the PinPoint with it connected directly to your computer.

Sets the modem operation to pass through mode. This mode will pass any characters received on the serial port directly to the internal hardware module and output any characters from the internal hardware module out the serial port. This allows direct access/configuration of the hardware module. Once this mode is entered, the unit must be physically reset to return to normal operation.

This command is not available in Wireless Ace.



Note: It may take up to 30 seconds for the hardware module to respond after CONNECT is output.

SMTP (including SMS)

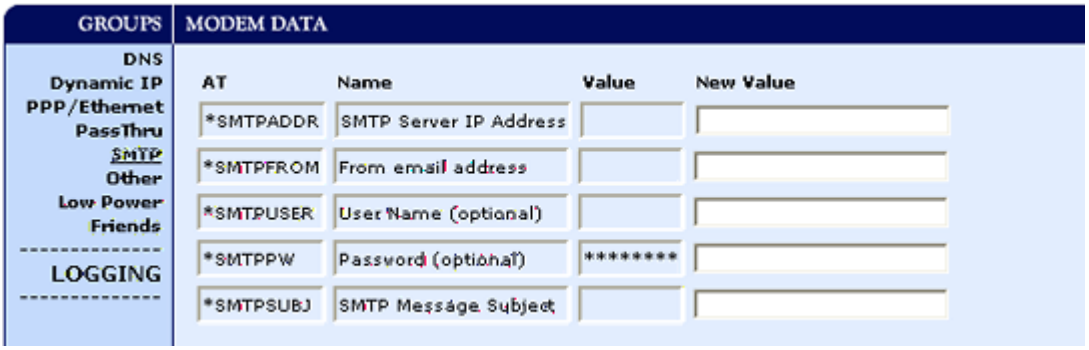
This group includes commands specific to messaging.

SMTP (Simple Mail Transfer Protocol) is the de facto standard for email transmission across the Internet. The PinPoint can send messages using SMTP if it has been configured to use a mail server.

SMS (Short Message Service) is another way to send messages via Your Wireless Service Provider's cellular network.

Caution: Your account with Your Wireless Service Provider may not support message sending with SMS. For most SMS commands (those not proceeded by *), you will need to have the modem in PassThru mode.

FIGURE 1. Common : SMTP



SMTPADDR=[d.d.d.d][name][nom]

Specify the IP address or Fully Qualified Domain Name (FQDN) of the SMTP server to use.

d.d.d.d=IP Address

name=domain name

Maximum: 40 characters.

SMTPFROM=email

Sets the email address from which the SMTP message is being sent.

email= email address

Maximum: 30 characters.

SMTPPW=password

Sets the password to use when authenticating the email account (*SMTPFROM) with the server (*SMTPADDR).

pass= password



Note: Not required to use SMTP settings but may be required by Your Wireless Service Provider.

SMTPSUBJ=subject*

Allows configuration of the default Subject to use if one isn't specified in the message by providing a "Subject: xxx" line as the initial message line.

subject= SMTP message subject

SMTPUSER=user*

The email account username to authenticate with the SMTP server (*SMTPADDR) for sending email.

user= username

Maximum: 40 characters.



Note: Not required to use SMTP settings but may be required by Your Wireless Service Provider.

Messaging related AT Commands not Available through Wireless Ace

NETSMS2EMAIL=n*

Specify the SMS/E-mail server number. This maybe necessary to send an SMS message to an email address .

n=SMS/E-mail server

SMTPSEND=[email][body]*

Sends an email to the address specified, followed by the body of the email message.

email= email address

body= message body

The email message is terminated and sent by entering a **.** or **Ctrl-Z** on an empty line.

See also *SMTPSUBJ, *SMYPFROM, and *SMTPADDR.

***SMTPSTATUS?**

Returns the status of the last issued SMTP message (*SMTPSEND). If no status is available **0** is returned. Once read, the status is cleared out.

The status codes returned come from the SMTP server to which that the modem sent the request. Unless the receiving server is not standard, they follow the RFC for SMTP.

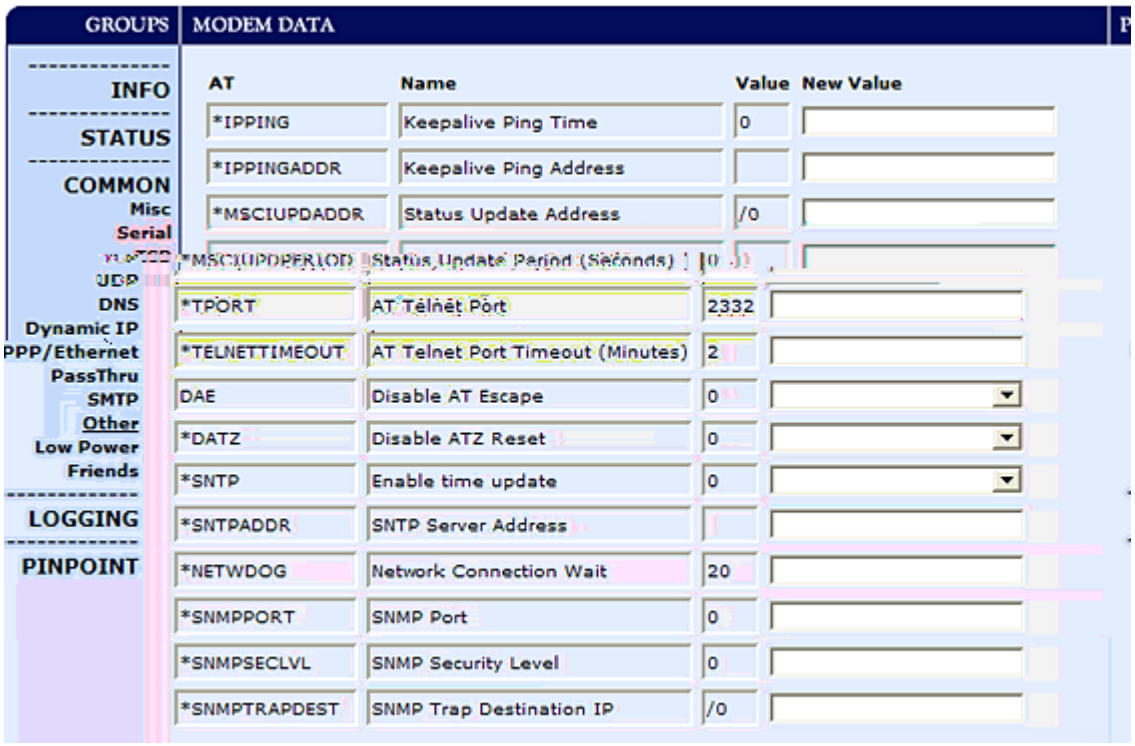
Example: 354 = send in progress, 250 = sent ok.

Other

The commands in this group are not specific to the other group categories.

The commands displayed in Wireless Ace and the results of those commands depends on the model of the modem.

FIGURE 1. Common : Other



DAE=*n*

Disable AT Escape Sequence detection.

n=**0 :** Enable +++ AT escape sequence detection.

n=**1 :** Disable +++ AT escape sequence detection.

*DATZ=*n*

Enables or disables reset on ATZ.

n=**0 :** Normal Reset (Default)

n=**1 :** Disable Reset on ATZ

*IPPING=*n*

Set the period to ping (if no valid packets have been received) a specified address (*IPPIN-GADDR) to keep the modem alive (online).



n=15-255 minutes

n=**0 :** Disable pinging (default)

15 minutes is the minimum interval which can be set for Keepalive.

See also *MINXMIT which can override this value.

***IPPINGADDR**=*[d.d.d.d][name]*

Set the IP address or valid internet domain name for the PinPoint to ping to keep itself alive (online). *IPPING must to be set to a value other than 0 to enable pinging.

d.d.d.d=IP address

name= domain name

MSCIUPDADDR=name[/port]*

Modem Status Update Address - where Name/Port is the domain name and port of the machine where the modem status updates will be sent. The PinPoint's status parameters are sent in an XML format.

name=domain name

port=port

MSCIUPDPERIOD=n*

Modem Status Update Period - where n defines the update period in seconds.

n=1-255 seconds

n=**0 :** Disabled.

NETWDOG=n*

Network connection watchdog: The number of minutes to wait for a network connection. If no connection is established within the set number of minutes, the PinPoint resets.

n=minutes Default = 20 min.

n=**0 :** Disabled.

SNMPCOMMUNITY=n*

The SNMP Community String acts like a password to limit access to the modem's SNMP data.

n=a string of no more than 20 characters (default = public).

SNMPPORT=n*

This controls which port the SNMP Agent listens on.

n=1-65535

n=**0 :** SNMP is disabled.

SNMPSECLVL=n*

Selects the security level requirements for SNMP communications as follows:



n=**0 :** No security required. SNMPv2c and SNMPv3 communications are allowed.

n=**1 :** Authentication equivalent to “authNoPriv” setting in SNMPv3. SNMPv3 is required to do authentication, SNMPv2c transmissions will be silently discarded.

n=**2 :** Authentication and encryption, equivalent to “authPriv”' setting in SNMPv3. SNMPv3 is required to do authentication and encryption, SNMPv2c and SNMPv3 authNoPriv transmissions will be silently discarded. Messages are both authenticated and encrypted to prevent a hacker from viewing its contents.

*SNMPTRAPDEST=*host/[port]*

Controls destination for SNMP Trap messages.

host=IP address

port=TCP port

If port is 0 or host is empty, traps are disabled.

Traps are sent out according to the SNMP security level (i.e. if the security level is 2, traps will be authenticated and encrypted). Currently, the only trap that can be generated is linkup.

*SNTP=*n*

Enables daily SNTP update of the system time.

n=**0 :** Off

n=**1 :** On

SNTPADDR=[d.d.d.d][name]*

SNTP Server IP address, or fully-qualified domain name, to use if *SNTP=1.

d.d.d.d=IP

name=domain name

If blank, **time.nist.gov** is used.

*TELNETTIMEOUT=*n*

Telnet port inactivity time out.

n=minutes

By default, this value is set to close the AT telnet connection if no data is received for 2 minutes.

*TPORT=*n*

Sets or queries the port used for the AT Telnet server. If 0 is specified, the AT Telnet server will be disabled. The default value is **2332**. .

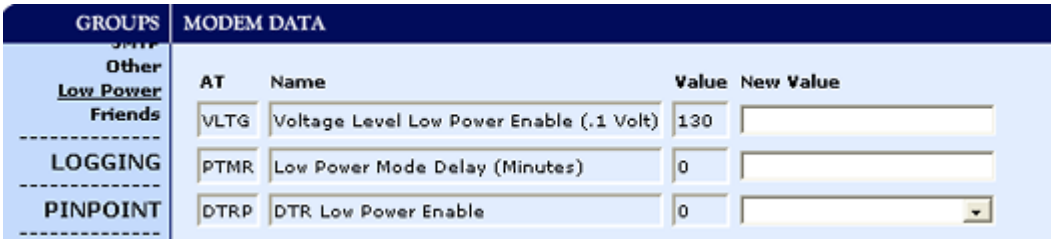
n=1-65535

n=**0 :** Disabled.

Low Power

The PinPoint will put itself into a low power using mode when configured events occur (page 30). Low Power mode is essentially a standby mode which uses minimal power while being ready to "come alive" quickly.

FIGURE 1. Common : Low Power



DTRP=*n*

Set or query the DTR power control.

n=**0 :** Ignore DTR for power control.

n=**1 :** Enter low power mode when DTR is low.

n=**2 :** Enter low power mode when DTR is high.

See also **PTMR**.

PTMR=n

Number of minutes after one of the power down events (VTLG or DTRP) happens until the PinPoint enters the low power mode.

n=0 - 255 minutes

If DTRP and VLTG are both 0 (zero), this setting does nothing.

Note: There is always a minimum of 1 minute between power down event and actual shut-down (to give the PinPoint time to prepare); entering zero will not power down the modem immediately, but after one minute.

In the first 5 minutes after PinPoint powers up, power down events are ignored to give the user time to change configurations.

VLTG

Set or query the voltage level at which the PinPoint goes into low power mode.

n=threshhold in tenths of volts

Example: **ATVLTG=130** would place the modem in a low power use, standby state if the voltage goes below 13.0V.

n=**0 :** Ignore voltage for power control.

Power related commands in other command groups

*POWERMODE?

In the **Status** group, *POWERMODE displays the current power state/mode.

FIGURE 2. Status : *POWERMODE?



Possible values returned are:

- **Initial**

  The modem is in the initial 5 minutes since power up, so power down event will be ignored.
- **On**

  Regular power on, i.e. a power down is not pending.
- **Low Cancellable**

  Power down is pending but still cancelable if the power down trigger goes away.
- **Low Pending 1 and 2**

  Power down is pending, any modem tasks are gracefully preparing for the power down.
- **Low Final**

  Power down is imminent.
- **Low**

  Power is down.

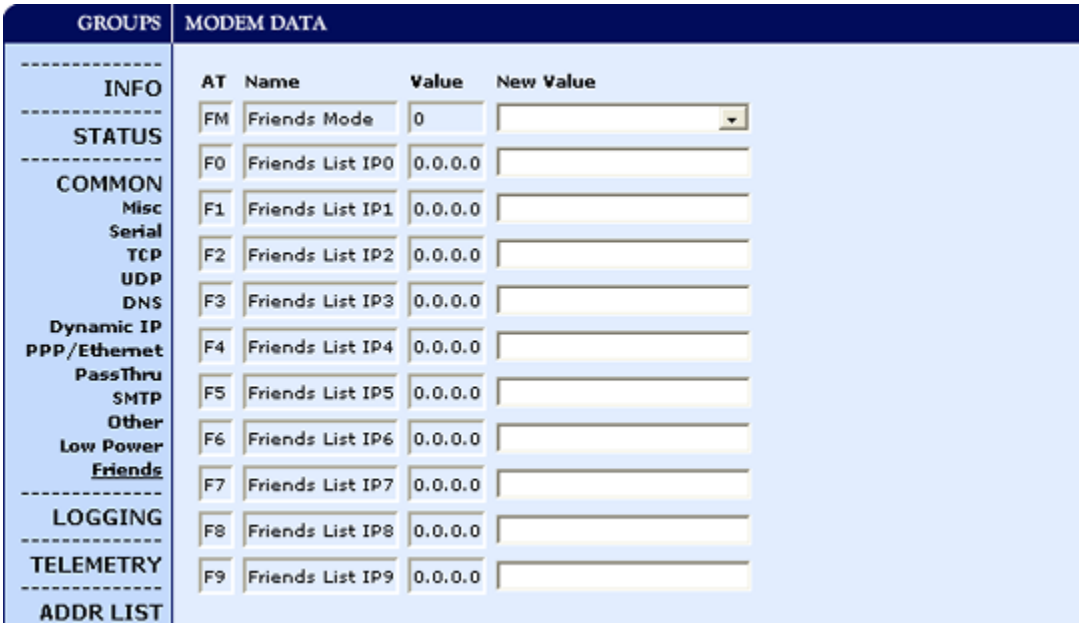
Friends

Friends Mode can limit access to the PinPoint from Your Wireless Service Provider's network and the Internet. Friends Mode is a basic firewall.

Note: Friends mode does not block any traffic from the cellular network, wanted or not. Friends Mode will only prevent the PinPoint from receiving data from those not on the Friends List. It does not prevent data from traversing the network to the modem which may billable traffic.

Caution: If you are using Friends Mode you will not be able to use Wireless Ace remotely or Telnet to the modem unless you are contacting the modem from one of the configured IP addresses.

FIGURE 1. Common : Friends



FM=*n*

Friends Mode - Only allow specified IPs to access the PinPoint.

n=**0 :** Disable Friends mode

n=**1 :** Enable Friends mode - Only packets from friends will be accepted (see below); packets from other IP addresses are ignored.

Fn=*[d.d.d.d]*

Friends mode IP address.

n=**0 - 9** Friends list index .

d.d.d.d =IP address

255 = allow any number 0-255

Example: 166.129.2.255 allows access by all IPs in the range 166.129.2.0-166.129.2.255.

ATF? will return a list of all the current F*n* settings.

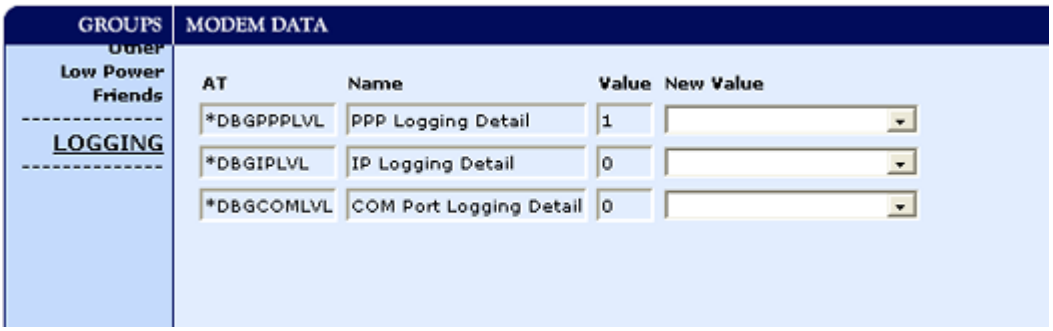
Logging

This group includes commands specific to the internal log.

Caution: Logging is intended for diagnostic purposes only. Extensive use of logging features can cause degraded modem performance.

The commands displayed in Wireless Ace and the results of those commands depends on the model of the modem.

FIGURE 1. Logging



*DBGCOMMLVL=*n*

Set the logging level for the host or module COM port.

n=**0 :** No logging

n=**1 :** Host COM

n=**2 :** Module COM

*DBGIPLVL=*n*

Sets the logging level for the IP subsystem.

n=**0 :** No logging

n=**1 :** Log errors (i.e. invalid/corrupt packets, etc.).

n=**2 :** Log the header of all received packets. Note that this can quickly exhaust available space for the event log.

n=**3 :** Log the header of all received and sent packets. Note that this can quickly exhaust available space for the event log.

*DBGPPPLVL=*n*

Sets the logging level for the PPP stack.

Enables logging at different levels of detail.

n=**0 :** No logging

n=**1 :** Log client events (default)

n=**2 :** Log server events

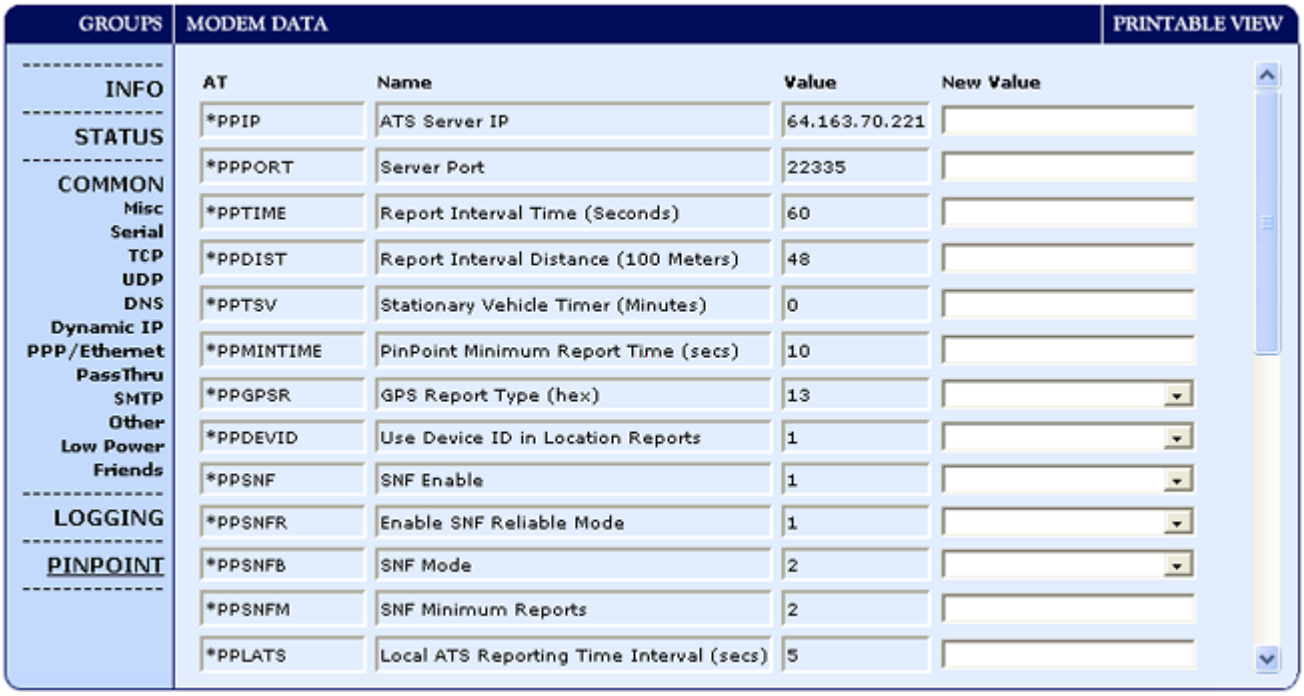
n=**3 :** Log client and Server events

PinPoint

This group includes commands specific to the PinPoint and GPS.

This screen shot does not show all the commands on the Wireless Ace PinPoint menu, scroll down in Wireless Ace for the rest of the PinPoint commands. Some commands detailed here may not be available for your modem model.

FIGURE 1. PinPoint



DTRI=*n*

Enable monitoring the DTR signal as in input event.

n=**0 :** Disable DTR input monitoring.

n=**1 :** Enable DTR input monitoring.

Note: If DTR is used as an input, DTR cannot be used for low-power control.

RTSI=*n*

Enable monitoring the RTS signal as in input event.

n=**0 :** Disable RTS input monitoring.

n=**1 :** Enable RST input monitoring.



Note: If RTS is used as an input, hardware flow control cannot be enabled.

#IG=*n*

Set or query GPS initialization timer.

n=seconds

Time in seconds to wait for GPS acquisition before transmitting at high rates.

*MF=*hh*

Set or query GPS format, where hh is a hex value; 8E (transmit Latitude/Longitude/Direction/Velocity/Time in binary) or 8F.

hh=hex value



*MF is support for legacy GPS reports which are rarely used by current tracking applications.

*PGPS=*n*

Send NMEA GPS strings out serial link [n=1]. Similar to **ATGPS** except that the ***PGPS** value can be saved to NVRAM so that it will continue to operate after resets.

n=**0 :** Disabled

***n*=1:** Send NMEA GPS strings out serial link.

*PPCOM1000=*n*

Enables support for extra inputs from a COM1000.

n=**0 :** Disable

n=**1 :** Enable

*PPDEVID=*n*

Whether or not the PinPoint should include the 64-bit device ID in its GPS reports.

n=**0 :** Disable ID

n=**1 :** Enable/display ID



Note: *PPPDEVID MUST be 1 if the modem uses a Dynamic IP.

*PPDIST=*n*

GPS Report Distance Interval in 100 Meter Units (kilomater). 1 mile is approximately 1600 kilometers.

n=1-65535

n=**0 :** Disabled

*PPFLUSHONEVT=*n*

Flushes store and forward buffer when an input event (DTR/RTS) occurs.

n=**0 :** Disable

n=**1 :** Enable

*PPGPSDATUM=*n*

Specifies the GPS datum to use for position reports. For accurate results, this value should match the datum used by receiving mapping application.

n=**0 :** WGS84

n=**92 :** NAD27

n=**115 :** NAD83

Note: This command may not be available for your PinPoint. This requires specific internal hardware as well as a recent version of ALEOS.

*PPGPSSENTENCES=*n*

Specifies the NMEA sentences to display in the NMEA GPS Report.

n=**0-65535** (hex)

*PPGPSR=*n*

GPS report type.

n=**0 :** Use legacy reports specified in *MF value. **Note:** Must also have ***PPDEVID=0**.

n=**0x11 :** Standard GPS Report

n=**0x12 :** Standard GPS Report + UTC Date

n=**0x13:** Standard GPS Report + UTC Date + RF data

n=**0xD0 :** Xora reports.

n=**0xE0 :** GGA and VTG NMEA reports

n=**0xE1:** GGA, VTG and RMC NMEA reports

n=**0xF0 :** TAIP reports .

n=**0xF1 :** Compact TAIP data

*PPIGNOREIP=*n*

When enabled, ignore ATS Server IP (*PPIP) updates in RAP.

n=**0 :** Use ATS Server IP updates.

n=**1 :** Ignore ATS Server IP updates.

*PPINPUTEVT=*n*

Enable sending input changes as events (different report types).

n=**0 :** Disabled

n=**1 :** Enabled Activée

*PPIP=*d.d.d.d*

IP address where GPS reports are sent (ATS Server IP). Also see ***PPPORT**.

d.d.d.d=IP address

Example: **AT*PPIP=192.100.100.100**

*PPLATS=*n*

Local ATS - Causes GPS reports to also be sent out the serial link every n seconds, when there is a PPP connection to the serial host is established.

n=1-255 seconds

n=**0 :** Disabled



Sends to the PPP peer IP **S110** with the Destination Port number **S53**.

*PPLATSEXTRA=*n*

Have local ATS reporting (LATS) send up to 7 extra copies of a GPS report to the subsequent ports.

n=**1-7 :** Send GPS report copies to that number of ports.

n=**0 :** Just the original report is sent (default).

Example: If **AT*PPLATSEXTRA=7** and the port in **S53** is 1000, then GPS reports will be sent to ports 1000-1008.

*PPLATSR=*n*

Indicates the type of GPS report to send to the local client (PPP/SLIP peer). See ***PPGPSR**.

n=**0x11 :** Standard GPS Report

n=**0x12 :** Standard GPS Report + UTC Date

n=**0x13:** Standard GPS Report + UTC Date + RF data

n=**0xD0 :** Xora reports.

n=**0xE0 :** GGA and VTG NMEA reports

n=**0xE1:** GGA, VTG and RMC NMEA reports

n=**0xF0 :** TAIP reports .

n=**0xF1 :** Compact TAIP data

*PPMINTIME=*n*

Specifies the minimum amount of time between reports generated due to either the time interval (***PPTIME**) or the distance interval (***PPDIST**). This is useful to limit network traffic and make more efficient use of bandwidth. This can be used in conjunction with store and forward. The minimum value which this setting can take depends on the policies of the carrier.

n =**1-65535** seconds

n=**0 :** Disabled

*PPODOM=*n*

Enable odometer reporting.

n=**0 :** Disabled (default)

n=**1 :** Enabled

*PPODOMVAL=*n*

The PinPoint's current odometer value. The value is in meters. Maximum value is approximately 4.3 billion meters (2.5 million miles). 1 mile is approximately 1600 meters.

n=meters

*PPPORT=*n*

Port where GPS reports are sent. See also **SIP**.

***n*=1-65535**

*PPSNF=*n*

Set or query the GPS report Store and Forward feature.

n=**0 :** Disabled

n=**1 :** Enabled (default)

Store and Forward will cause GPS reports to be stored up if the PinPoint goes out of network coverage. Once the vehicle is in coverage the GPS reports will be sent en masse to the server.

*PPSNFB=*n*

Store and Forward Behavior. When ***PPSNF=1**, the type of Store and Forward behavior is defined by:

n=**0 :** Normal Store and Forward. Data is stored when the PinPoint is out of EDGE/GPRS coverage; when the PinPoint is in coverage, data is sent to server as soon as possible. This is the default for PinPoints with RAP version 1.3 or lower. PinPoint

n=**1 :** Data sent only when polled. Data is stored until polled using the Poll command sent by a server.

n=**2 :** Grouped Reports. Data is stored until the desired minimum number of reports (see ***PPSNFM**) has been stored. The data is then sent to the server in groups with at least the specified number of reports.

*PPSNFM=*n*

Store and Forward Minimum Reports.

***n*=0-255**

Specifies the minimum number of reports that must be stored before they are forwarded to the server. The data is then sent to the server in packets that contain at least this number of reports.

*PPSNFR=*n*

Store and Forward Reliability:

n=**0 :** Disabled

n=**1 :** Reliable mode enabled for RAP messages

GPS reports will be retransmitted if not acknowledged by the server.

*PPTAIPID=*nnnn*

Sets/queries the TAIP ID. This ID is returned in TAIP reports if it has been negotiated with the TAIP client. This value is only used in conjunction with TAIP emulation mode (***PPGPSR=F0**).

nnnn=TAIP ID (4 characters)

*PPTIME=*n*

GPS Report Time Interval See also ***PPMINTIME**, ***PPTSV**

n=seconds (1 - 65535)



Caution: A report time of less than 30 seconds can possibly keep an RF link up continuously. This will eventually cause the PinPoint to overheat and shutdown. An RF resource may continue be tied up to transfer small amounts of data. Generally the RF channel will be released and go dormant in 10-20 seconds of no data sent or received.



Note: Your Wireless Service Provider may impose a minimum transmit time.

*PPTSV=*n*

Timer for Stationary Vehicles. Time interval in minutes that the PinPoint will send in reports when it is stationary.

n=1-255 minutes

n=**0 :** Disabled

For example, if ***PPTIME=10**, the PinPoint will send in reports at least every 10 seconds while it is moving; however, once it stops moving, it will slow the reports down to this ***PPTSV** value.

*UDPRGPS=*n*

Set or query GPS stamping of UDP Reliable packets. When set, data received on the host serial port will be encapsulated with the GPS date and time.

n=**0 :** Disabled (default)

n=**1 :** Enabled

PinPoint related AT Commands not Available through Wireless Ace

GPS*n*

Send NMEA GPS strings out serial link. See also ***PGPS**.

ATGPS (no parameter) will cause the NMEA GGA, RMC, and VTG GPS strings to output to the serial port one time.

n=**1 : ATGPS1** will cause these strings to be sent out the serial link once per second continuously until **ATGPS** or until reset.

#U

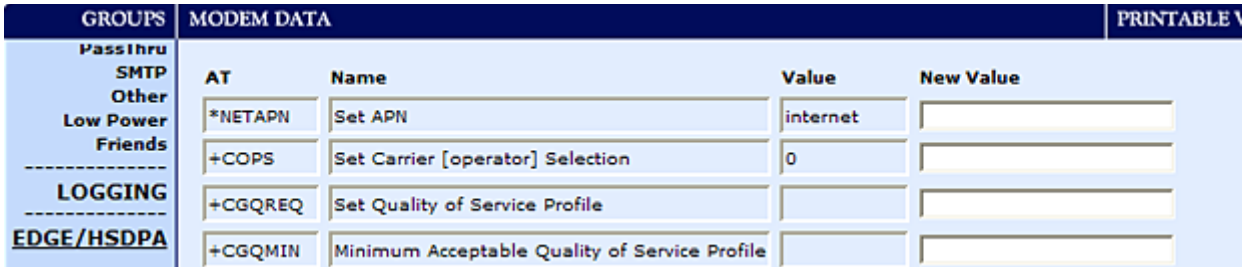
Immediately issue GPS report to the ATS server IP and port.

EDGE/HSDPA

This group includes commands specific to EDGE and GPRS.

The commands displayed in Wireless Ace and the results of those commands depends on the model of the modem.

FIGURE 1. EDGE/HSDPA



*NETAPN=*apn*

Easy entry of the APN.

apn=access

If left blank, the modem will attempt to use the default subscriber value as defined by the account.

+CGQMIN

Minimum Acceptable Quality of Service Profile.

Change should be at carrier's request. Normally not required to be changed.

+CGQREQ

Set Quality of Service Profile.

Change should be at carrier's request. Normally not required to be changed.

+COPS=*mode*,*[format][,oper]*

Manually specify an operator. Refer also to ***NETOP**.

mode=**0 :** Automatic - any affiliated carrier [default].

mode=**1 :** Manual - use only the operator <oper> specified.

mode=**4 :** Manual/Automatic - if manual selection fails, goes to automatic mode.

format=**0 :** Alphanumeric ("name") (G3310 must use this format).

format=**2 :** Numeric

oper=”name”

APPENDIX D

SNMP (NMS)

The PinPoint can be configured as an SNMP agent and supports SNMPv2c and SNMPv3.

SNMP Overview

The Simple Network Management Protocol (SNMP) was designed to allow remote management and monitoring of a variety of devices from a central location. The SNMP management system is generally composed of agents (such as your PinPoint, a router, a UPS, a web server, a file server, or other computer equipment) and a Network Management Station (NMS) which monitors all the agents on a specific network. Using the management information base (MIB), an NMS can include reporting, network topology mapping, tools to allow traffic monitoring and trend analysis, and device monitoring.

Authentication ensures SNMP messages coming from the agent, such as the PinPoint, have not been modified and the agent may not be queried by unauthorized users. SNMPv3 uses a User-Based Security Model (USM) to authenticate and, if desired or supported, message encryption. USM uses a user name and password specific to each device.

Management Information Base (MIB)

The management information base (MIB) is a type of database used to compile the information from the various SNMP agents. Reports from various agents, such as the PinPoint, are sent as data in form designed to be parsed by the NMS into its MIB. The data is hierarchical with entries addressed through object identifiers.

SNMP Traps

SNMP traps are alerts that can be sent from the managed device to the Network Management Station when an event happens. Your PinPoint is capable of sending the linkUp trap when the network connection becomes available.

PinPoint SNMP Configuration

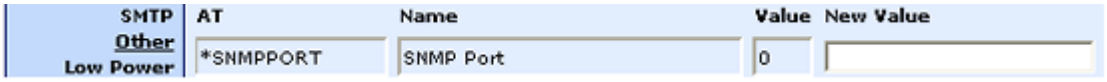
To configure your PinPoint to work as an SNMP agent, you can use either Wireless Ace, or a terminal connection to configure the modem using AT commands. In Wireless Ace, the SNMP commands are all on the **Other** menu option.

There are only three commands to set for SNMP in the PinPoint: the listening port, the security level, and the trap destination.

Listening Port

*SNMPPORT sets the port for the SNMP agent to listen on. If set to zero, default, SNMP is disabled.

FIGURE 1. Wireless Ace: *SNMPPORT

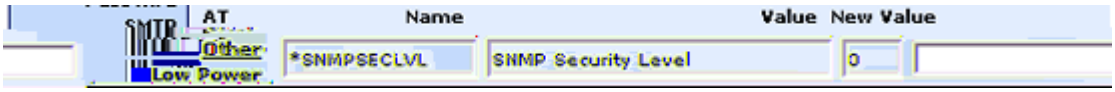


Note: SNMP generally uses port 161, however most Internet providers (including cellular) block all ports below 1024 as a security measure. You should be able to use a higher numbered port such as 10161.

Security Level

*SNMPSECLVL sets the security level and which version of SNMP communications are used.

FIGURE 2. Wireless Ace: *SNMPSECLVL



0 - No security required. SNMPv2c and SMNPv3 communications are allowed.

1 - Authentication required. SNMPv3 is required to do authentication and SNMPv2c transmissions will be silently discarded. Authentication is equivalent to the authNoPriv setting in SNMPv3.

2 - Authentication required and messages are encrypted. SNMPv3 is required to do authentication. SNMPv2c and SNMPv3 authNoPriv transmissions will be silently discarded. Authentication and encryption is equivalent to the authPriv setting in SNMPv3.

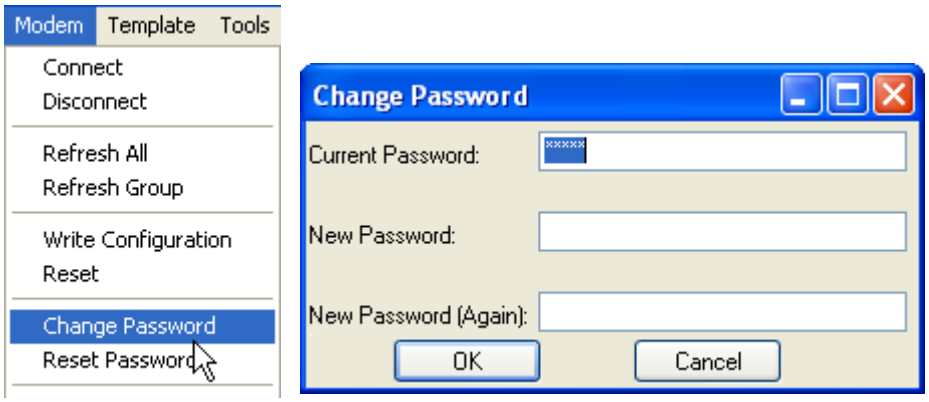
User Name and Password

The user name is '***user***'. The user name cannot be changed. The PinPoint's password is used as the SNMP password (default is '***12345***').

Note: The eight-character password requirement for SMNPv3 is not enforced by the PinPoint's Agent to allow the default password to function. Your SNMP administrator or MIS may require you to change to a more secure and/or longer password.

To change the password in the PinPoint, select **Modem** from the top menu line in Wireless Ace.

FIGURE 3. **Wireless Ace: Changing the PinPoint Password - Menu Option**



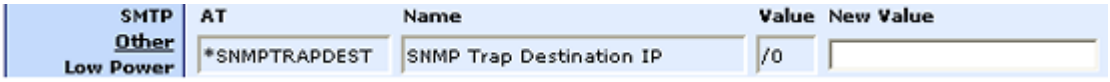
The current password will be pre-entered. As you type the new password and confirm it, the characters you type will be obscured by “x”. For the password, you can use numbers, letters, and/or punctuation.

Caution: The password is case sensitive. “drowssaP” is not the same as “drowssap”.

Trap Destination

*SNMPTRAPDEST needs to be set with the destination IP and port. If either are set to zero or empty, SNMP traps are disabled.

FIGURE 4. **Wireless Ace: *SNMPPORT**

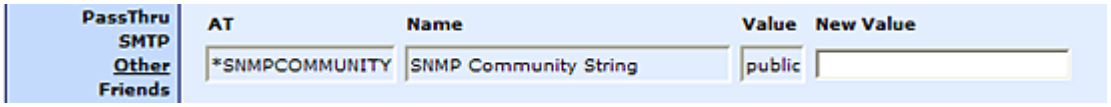


Note: Traps are sent out according to the SNMP security level (i.e. if the security level is 2, traps will be authenticated and encrypted). Currently, the only trap supported is ***LinkUp***.

Community String

The community string is configurable. The default is “public”.

FIGURE 5. **Wireless Ace: *SNMPPORT**



SNMP MIB Definition for AirLink

AIRLINK-MIB DEFINITIONS ::= BEGIN

```
IMPORTS
ObjectName FROM SNMPv2-SMI
MODULE-COMPLIANCE FROM SNMPv2-CONF;

org OBJECT IDENTIFIER ::= { iso 3 }
dod OBJECT IDENTIFIER ::= { org 6 }
internet OBJECT IDENTIFIER ::= { dod 1 }
private OBJECT IDENTIFIER ::= { internet 4 }
enterprises OBJECT IDENTIFIER ::= { private 1 }

airlink OBJECT IDENTIFIER ::= { enterprises 20542 }
general OBJECT IDENTIFIER ::= { airlink 1 }
common OBJECT IDENTIFIER ::= { airlink 2 }
status OBJECT IDENTIFIER ::= { airlink 3 }
gps OBJECT IDENTIFIER ::= { airlink 4 }

-- GENERAL --
phoneNumber OBJECT-TYPE
SYNTAX DisplayString (SIZE (10))
MAX-ACCESS read-only
STATUS current
   ::= { general 1 }

deviceID OBJECT-TYPE
SYNTAX DisplayString
MAX-ACCESS read-only
STATUS  current
   ::= { general 2 }

electronicID OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS current
   ::= { general 3 }
```



```
modemType OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS read-only
STATUS current
   ::= { general 4 }

aleosSWVer OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS current
   ::= { general 5 }

aleosHWVer OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { general 6 }

modemSWVer OBJECT-TYPE
SYNTAX   DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { general 7 }

modemHWVer OBJECT-TYPE
SYNTAX   DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { general 8 }

-- COMMON --
date OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { common 1 }
```



```
otaProgrammingEnable OBJECT-TYPE
SYNTAX  INTEGER {
disabled(0),
enabled(1) }
MAX-ACCESS  read-only
STATUS  current
   ::= { common 2 }

devicePort OBJECT-TYPE
SYNTAX  INTEGER(0..65535)
MAX-ACCESS  read-only
STATUS  current
   ::= { common 3 }

netUID OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS   current
   ::= { common 4 }

netPW OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { common 5 }

requestPAP OBJECT-TYPE
SYNTAX   INTEGER {
no(0),
yes(1) }
MAX-ACCESS  read-only
STATUS  current
   ::= { common 6 }

destinationAddress OBJECT-TYPE
```



```
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { common 7 }

destinationPort OBJECT-TYPE
SYNTAX   INTEGER(0..65535)
MAX-ACCESS  read-only
STATUS  current
   ::= { common 8 }

serialPortSettings OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { common 9 }

serialPortFlowControl OBJECT-TYPE
SYNTAX  INTEGER {
none(0),
hardware(2),
software(4) }
MAX-ACCESS  read-only
STATUS  current
   ::= { common 10 }

-- STATUS --
ipAddress OBJECT-TYPE
SYNTAX IpAddress
MAX-ACCESS  read-only
STATUS  current
   ::= { status 1 }

netState OBJECT-TYPE
SYNTAX DisplayString
MAX-ACCESS  read-only
```



```
STATUS  current
   ::= { status 2 }

netChannel OBJECT-TYPE
SYNTAX  INTEGER
MAX-ACCESS  read-only
STATUS  current
   ::= { status 3 }

rssi OBJECT-TYPE
SYNTAX   INTEGER(-125..-50)
MAX-ACCESS  read-only
STATUS current
    ::= { status 4 }

serialSent OBJECT-TYPE
SYNTAX  INTEGER
MAX-ACCESS  read-only
STATUS  current
   ::= { status 5 }

serialReceived OBJECT-TYPE
SYNTAX  INTEGER
MAX-ACCESS  read-only
STATUS   current
   ::= { status 6 }

hostMode OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { status 7 }

powerMode OBJECT-TYPE
SYNTAX   DisplayString
MAX-ACCESS  read-only
```



```
STATUS  current
   ::= { status 8 }

fixObtained OBJECT-TYPE
SYNTAX  INTEGER {
no(0),
yes(1) }
MAX-ACCESS  read-only
STATUS  current
   ::= { gps 1 }

satelliteCount OBJECT-TYPE
SYNTAX  INTEGER
MAX-ACCESS  read-only
STATUS current
::= { gps 2 }

latitude OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
::= { gps 3 }

longitude OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
::= { gps 4 }

END
```

APPENDIX E Dial-up Networking (DUN)

Dial-up Networking (DUN) allows a computer or other device to use the serial port on your PinPoint to connect to the Internet or private network using PPP just like an analog modem using a standard phone line.

Microsoft Windows XP is used in the examples below. The modem driver installation and DUN setup and configuration is similar in Microsoft Windows products. Examples are not provided here for installing the driver or configuring DUN for any other operating system.

Caution: To install any driver on your computer, you may need to be logged in as Administrator or have Administrator privileges for your login.

Installing the Modem Driver in Microsoft Windows

Standard installations of Microsoft Windows XP and 2000 include a generic modem driver which will work with your PinPoint.

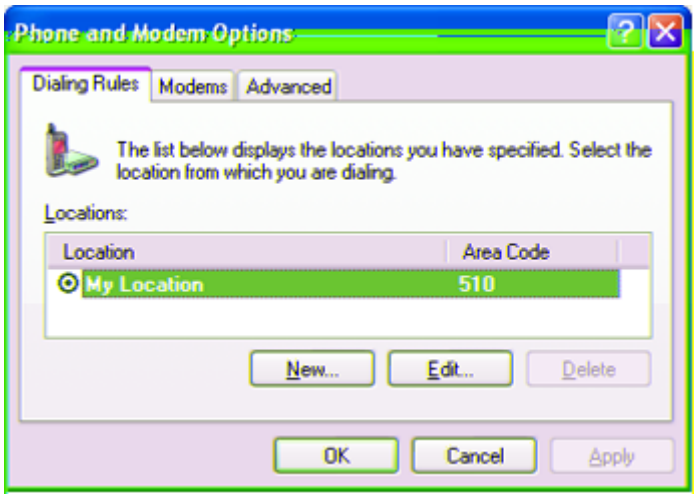
1. Connect the PinPoint.

   a. Connect the modem to the computer with the DB-9 cable.
   b. Plug in the AC adapter, connect the antenna(s) and power on the modem.

2. Install the driver.

   a. Select **Start > Control Panel > Phone and Modem Options** (in Classic View).

FIGURE 1. Phone and Modem Options



b.In the Phone And Modem Options dialog box. Select the **Modems** tab. Select **Add**.

FIGURE 2. Modems

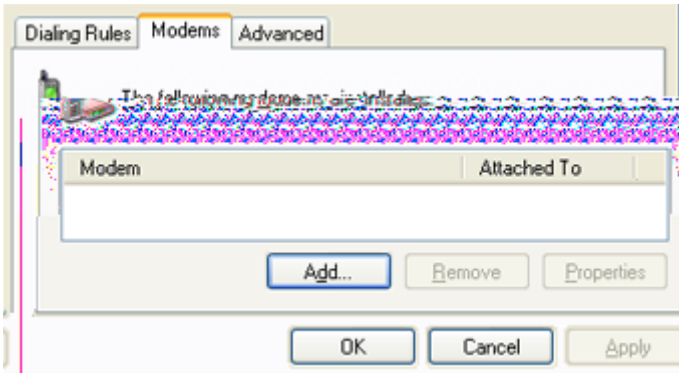
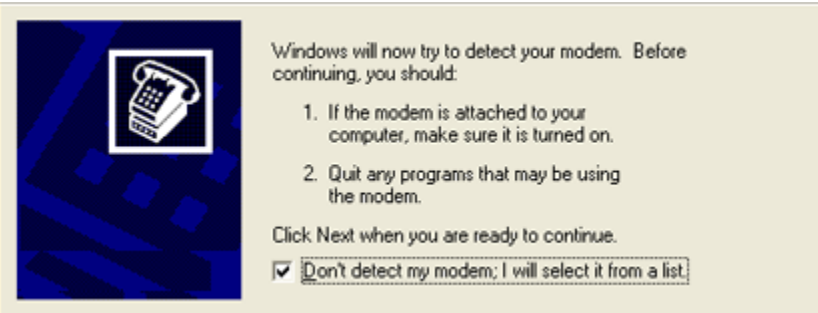


FIGURE 3. Install New Modem

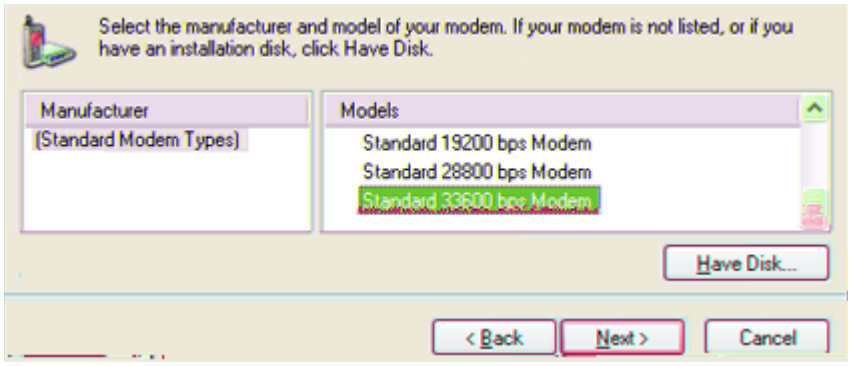


c. Check **Don't detect my modem; I will select it from a list** and select **Next**.

d. Select **(Standard Modem Types)** from the Manufacturers column, select **Standard 33600 bps Modem** from the Models column, and select **Next**.

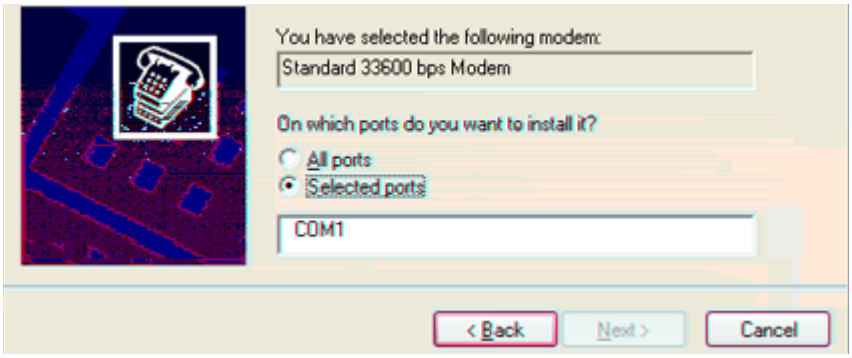
Note: If you have the speed for your modem configured as something other than the default, use the Standard Modem that matches the speed you configured.

FIGURE 4. Modem Driver



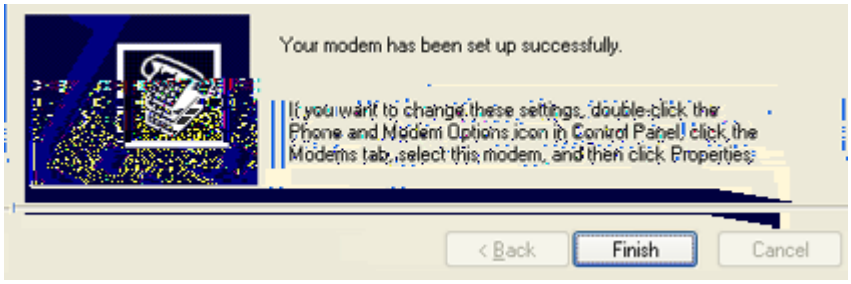
e. Check **Selected Ports**, select the COM port the modem is connected to (commonly COM1), and select **Next**.

FIGURE 5. Modem Port



f. Once the modem driver is installed, select **Finish**.

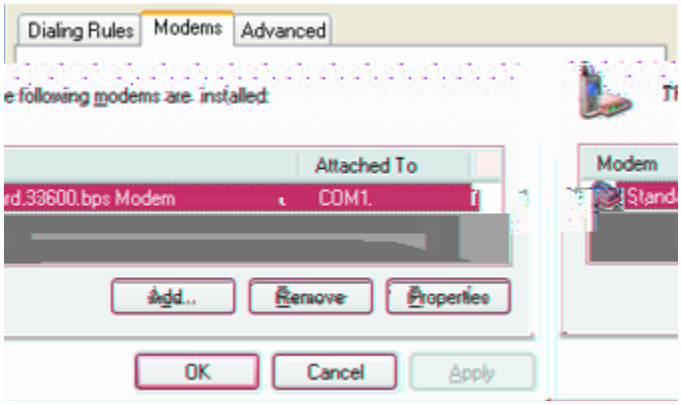
FIGURE 6. Finish



3. Configure the driver.

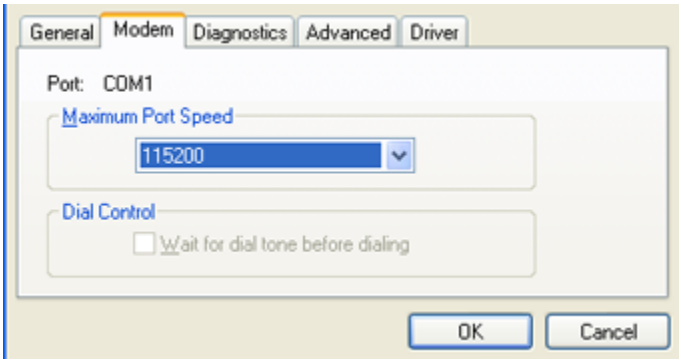
a. When you return to the Phone and Modem Options window, you should see the newly installed modem “attached to” the correct COM port. Highlight the modem and select **Properties**.

FIGURE 7. Modems



b. Select the **Modem** tab. **Maximum Port Speed** should be set to **115200** (default). Select **OK** to exit.

FIGURE 8. Setting Maximum Port Speed Maximum Port Speed



c. Select **OK** again to exit out of the Phone and Modem Options.

Dial-Up Networking (PPP) Configuration for Microsoft Windows

Once you have a driver for the modem installed on your computer, you can set up and configure Dial Up Networking (DUN) to use the modem as your connection to the Internet using PPP.

Before you start, you will need:

- Administrator privileges to the computer you are configuring or access granted by an administrator on the network to add/remove devices to your computer. (Not necessary on Windows 98/ME.)
- A wireless user account, password, and access number (obtained from Your Wireless Service Provider). *May not be required.*
- Windows COM Port and modem set up for a Standard 33600 Modem (see previous section).
- No other program running on your computer that is using the same COM port (serial port) configured for your modem.

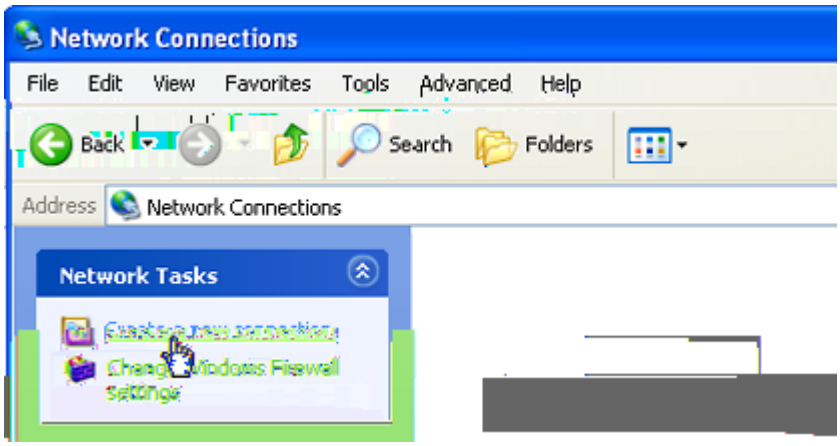
Caution: If you have an existing LAN connection, installing DUN for the modem may interfere with the LAN connection. It's recommended to disconnect your LAN connection before using a PPP connection with your PinPoint.

Once the DUN connection is initiated, by default, it will take over as the "default route" for network communication and specifically for Internet access. If you want the two connections to co-exist, you will need to de-select "Use default gateway on remote network" (described later) and use the route command in Windows to setup routing through the modem properly. This guide does not provide information on the route command. You may need to consult with your network administrator to properly configure routing.

1. Create a new network connection.

a. Select **Start > Connect > To Show All Connections** to open the **Network Connections** window.

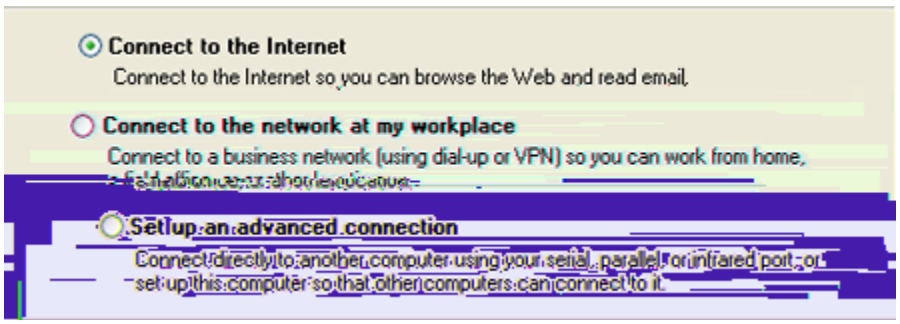
FIGURE 9. Network Connections



b. Select **Create a New Connection** under ***Network Tasks*** in the menu area on the left. Select **Next** to start installing and configuring the DUN connection.

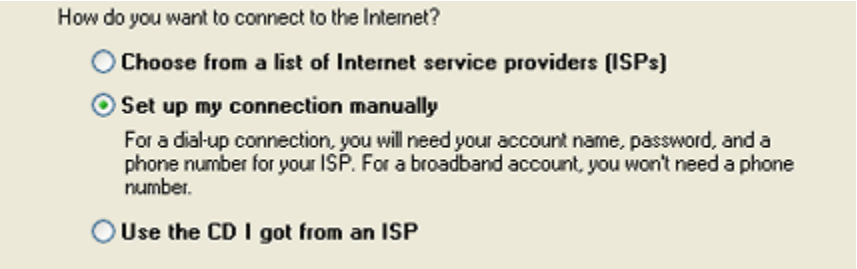
c. Select **Connect to the Internet** and then select **Next**.

FIGURE 10. Connection Type



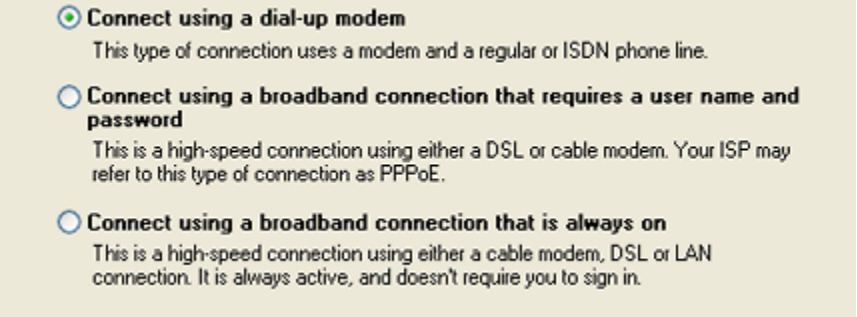
d. Select **Set up my connection manually** and then select **Next**.

FIGURE 11. Preparing the Internet Connection



e. Select **Connect using a dial-up modem** and select **Next**.

FIGURE 12. Internet Connection

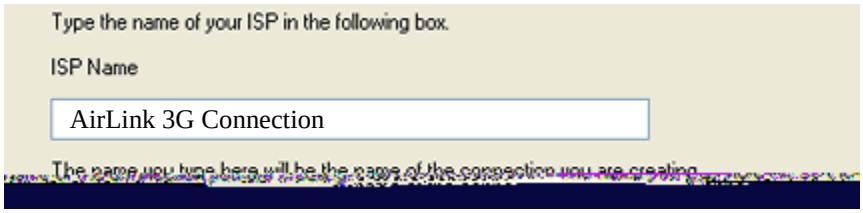


f. Type in a name for the connection, such as **AirLink 3G Connection**. Select **Next**.



The name provided here will not effect the connection in any way. It is only a label for the icon. It can be the name of your wireless service provider (Your Wireless Service Provider), your modem (PinPoint), or any other designation for the connection.

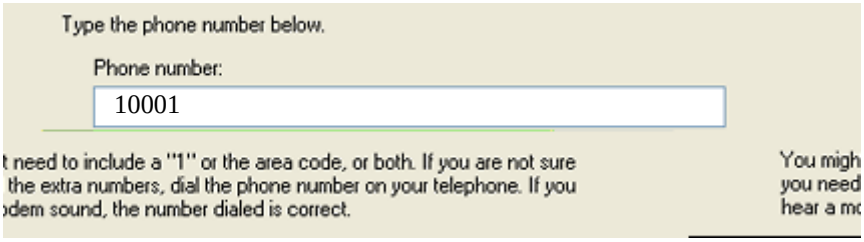
FIGURE 13. Connection Name



Optional: If you have multiple modems installed on your computer, you may be prompted to select the modem to be used. Check **Standard 33600 bps Modem** and select **Next**. If you only have one modem installed, this option will be omitted.

g. Type in as the phone number for the modem to dial and select **Next**.

FIGURE 14. Phone Number

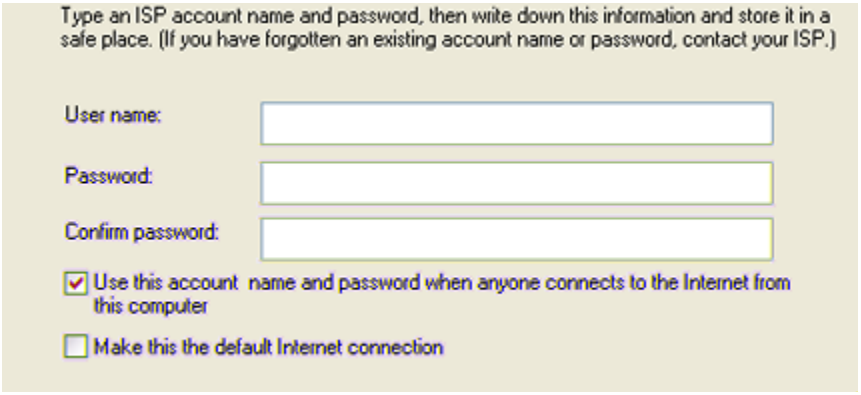


Optional: If you have multiple users configured for your computer, you may be prompted for *Connection Availability.* If you select **My use only**, the account currently logged on will be the only one able to use this DUN connection.

h. Generally the modem takes care of the Account Information (User name and Password) for the connection, so you can leave these fields blank (unless otherwise instructed by Support). If you want to allow others to use the same login for the modem, select **Use this account name and password...** Select **Next** to continue.

Caution: If you have a LAN connection to the Internet and select **Make this the default Internet Connection for the DUN configuration**, you will not be able to use the LAN to connect to the Internet and may also affect the network connection on your computer to the rest of the LAN. Select this option ONLY if the PinPoint will be your sole network connection.

FIGURE 15. Account Information



i. If you want to add a shortcut for this DUN connection to your desktop, check **Add a shortcut...** Select **Finish** to exit the ***Network Connection Wizard***.

FIGURE 16. **Finish**

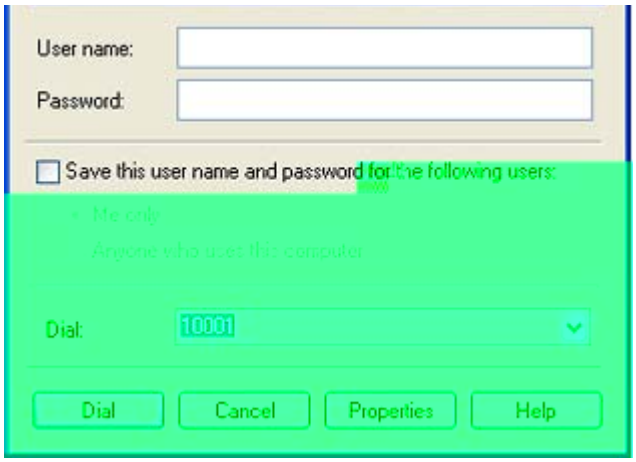


2. Configure the connection.

After you complete the New Connection Wizard, there are a few more things you will want to configure in the connection.

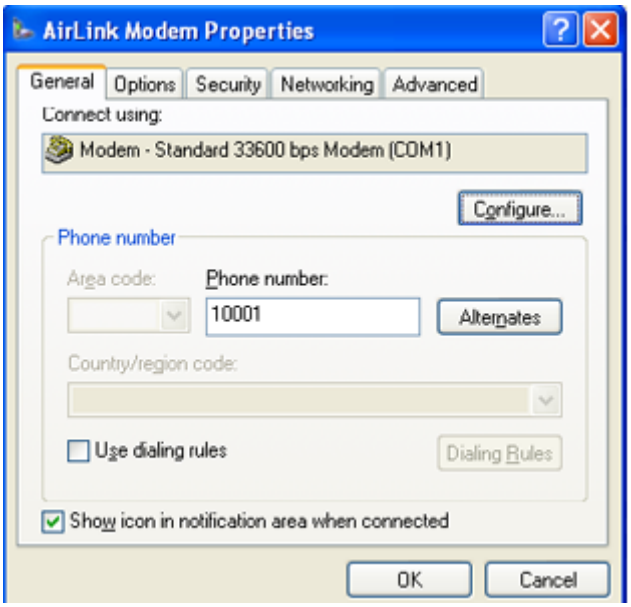
a. When the ***Connect*** window opens, select **Properties**.

FIGURE 17. **Connect**



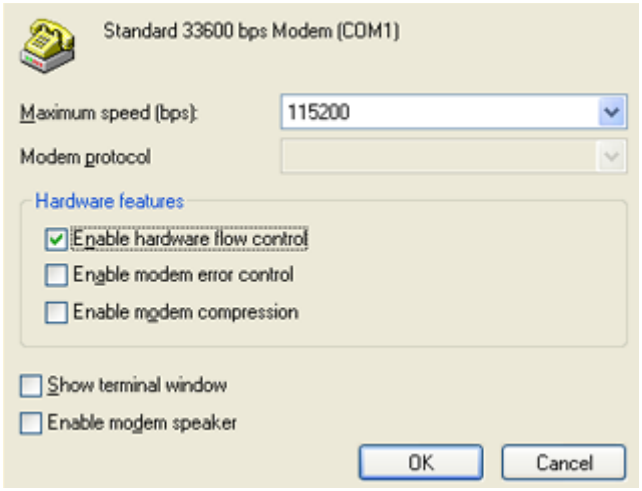
b. Uncheck **Use dialing rules**. Select **Configure**, below the ***Connect using*** line.

FIGURE 18. Modem Properties



c. Select **115200** as the ***Maximum speed***. Check **Enable hardware flow control**. Do not check any other option. Select **OK**.

FIGURE 19. Modem Configuration

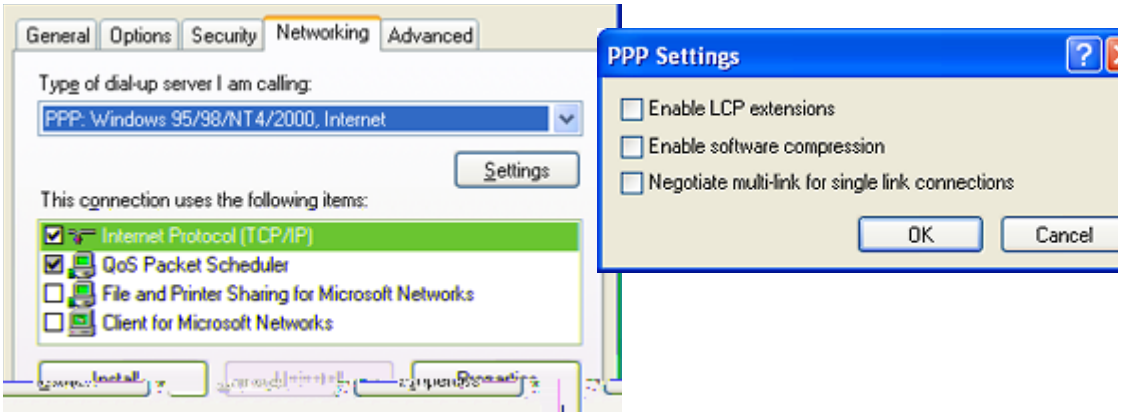


Optional: You may want to check the **Options** tab and change the settings for applications you might be using. The default options are generally applicable for most uses.

d. Unless specifically directed to do so by Support or your network administrator, you do not need to make any changes to the options on the **Security** tab.

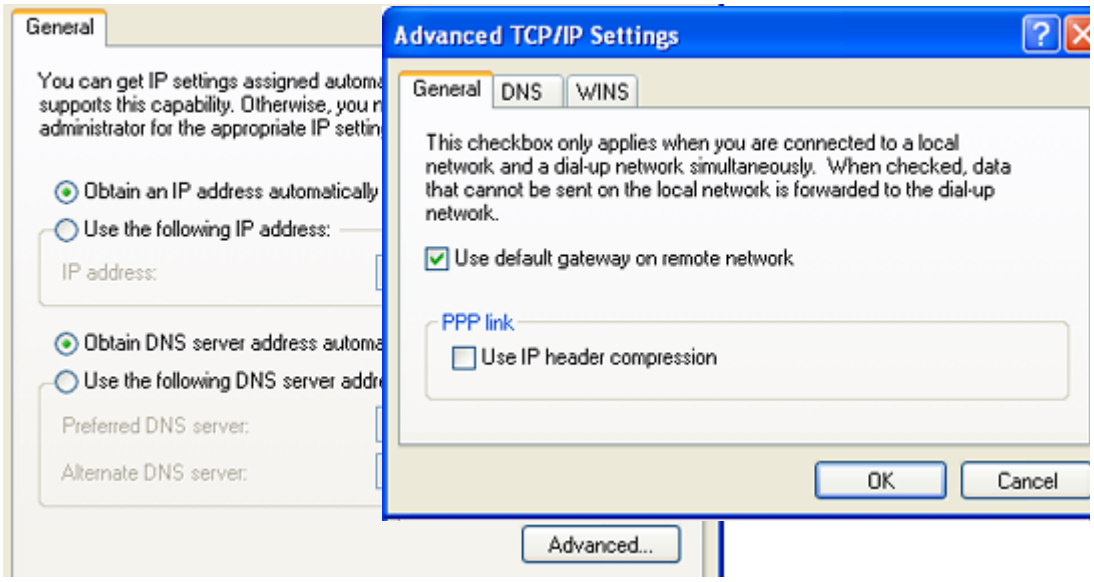
e. Select **Network**. Select **Settings**. Remove the checks from all three PPP settings. Select **OK**.

FIGURE 20. **Connection Properties - PPP Settings**



f. Select (highlight) **Internet Protocol (TCP/IP)** and then select **Properties**. For most configurations, you will be obtaining the IP address and the DNS server address automatically. Select **Advanced**. Uncheck **Use IP header compression**. Check **Use default gateway...** Select **OK**.

FIGURE 21. **Internet Protocol**



g. Select **OK** and **OK** again to return to the ***Connect*** window.

Making a DUN Connection

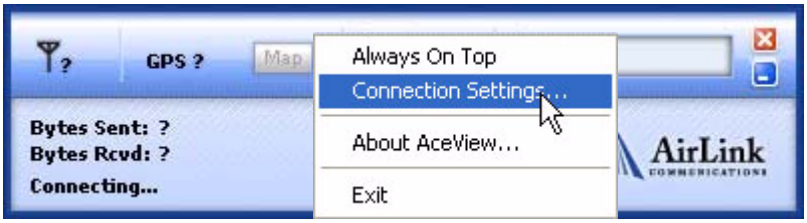
Establishing a DUN Connection using AceView

This guide assumes you have a default installation of AceView.

1. Start AceView.
   Start > All Programs > AirLink Communications > AceView

2. Right-click on the AceView window to open the menu and select **Connection Settings**.

FIGURE 22. AceView: Menu



a. Select **Auto Start** in the DUN section.

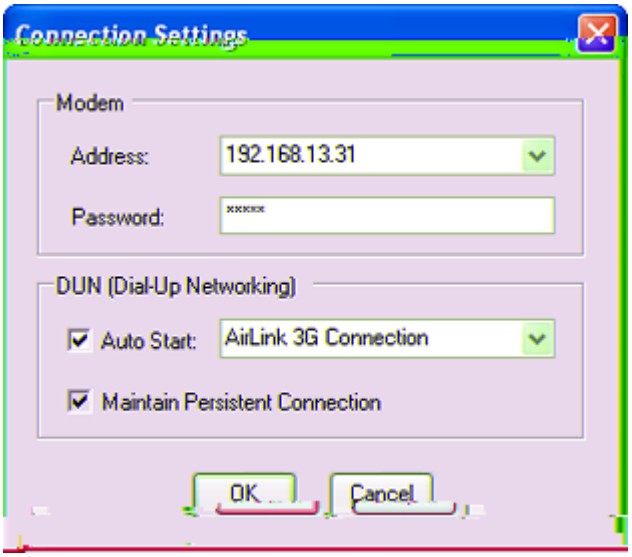
b. Select the DUN connection you have already installed on your computer from the drop down menu once you select Auto Start (you may only have 1 selection which would be preselected for you).

Note: When using the DUN connection, make sure the IP Address is set to the local IP address of the modem.

c. Select **Maintain Persistent Connection:** When checked, AceView will continually check the DUN connection to ensure it is not down. If so, AceView will attempt to connect again.

d. Click **OK**.

FIGURE 23. AceView: Connection Settings



AceView's window will show the dynamically updated status of your connection to Your Wireless Service Provider as well the status of the connection between your computer and your PinPoint. .

Windows 98 and Windows NT

The direct DUN connection features of AceView are not available in Windows 98 or Windows NT.

Establishing a DUN Connection with Windows Networking

1. Start the DUN session.

Start > Connect To > AirLink 3G Connection (or whatever you named the connection).

FIGURE 24. MS Windows XP: Connect



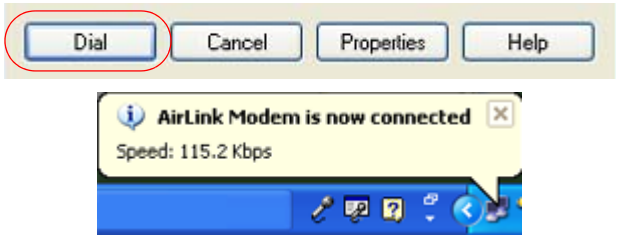
For some accounts, you need to enter the **User name** and **Password** provided by Your Wireless Service Provider for the cellular account.

You can also enter these parameters beforehand using ***NETUID** and ***NETPW** (refer to the AT Commands, page 59).

2. Connect to the network.

Select **Dial** to connect to the modem and the cellular network. When you're connected, an icon should appear in the system tray showing the connection status.

FIGURE 25. MS Windows XP: Connect



Note: The speed shown in the connection is the speed between the modem and your computer, it is not the speed of the modem's connection to the Carrier or the Internet.

Note: For DUN connections on a Windows Mobility or other non-personal computer, the DNS settings may not be configured with the DUN connection. You may need to go into the network settings and add DNS servers manually.



APPENDIX F GPS MESSAGES

This appendix shows the GPS message streams provided by the PinPoint.

NMEA Message Description

The standard GPS data stream provided by the PinPoint in raw serial (ASCII) format is comprised of (3) GPS NMEA receiver messages (“sentences”): GGA, RMC and VTG. All NMEA messages start with a dollar sign ($) followed by a message type identifier. After the identifier, the fields of the messages are comma deliminated.

Example taken from PinPoint output:

$GPGGA,173221.428,3505.1435,N,08037.5669,W,1,04,2.2,242.9,M,46.9,M,,0000*1E

TABLE 1. GGA - Global Positioning System Fix Data

Description	Field Contents
Global Positioning System (GPS)	GP
Global Positioning System Fix Data	GGA
UTC (Fix taken at 17:32:21 UTC)	173221.428
Latitude	3505.1435
North or South	N
Longitude	08037.5669
East or West	W
Fix Quality	1
(0=invalid, 1=GPS fix, 2=DGPS fix)	
Number of satellites being tracked	04
Horizontal dilution of precision (metres)	2.2
Antenna altitude above/below mean-sea-level (geoid)	242.9
Units of antenna altitude, meters	M
Geoidal separation, the difference between the WGS-84 earth ellipsoid and mean-sea-level (geoid)	46.9
"-" means mean-sea-level below ellipsoid	

Units of geoidal separation, meters	M
(not applicable to the PinPoint)	null field
Differential reference station ID, 0000-1023	0000
Optional checksum field consisting of "*" and two hex digits.	*1E
Represents the exclusive OR of all characters between, but not including, the "$" and "*".	

Example taken from PinPoint output:

$GPRMC,173219.428,A,3505.1436,N,08037.5669,W,0.09,13.55,040403,,,*2B

TABLE 2. RMC - Recommended Minimum Navigation Information

Description	Field Contents
Global Positioning System (GPS)	GP
Recommended Minimum sentence C Phase	RMC
UTC (Fix taken at 17:32:19 UTC)	173219.428
Status A=Active or V=Void	A
(A status of V indicated the GPS has a fix that is below an internal quality threshold, i.e. dilution of precision is too high or an elevation mask test failed)	

4.9(n).4(clu)-5.6(d).4(in)]TJ10.198entie>BDCBT9.96 0 0 9.96 402.54 641.34 Tm-.0004 Tc.0034 Tw(clu

Example taken from PinPoint output:

$GPVTG, 308.49,T,,M,0.05,N,0.1,K,*62

TABLE 3. VTG - Vector track and Speed over the Ground

Description	Field Contents
Track Degrees	308.49
True = T	T
Track Degrees	null field
Magnetic = M	M
Speed Knots	0.05
Knots = N	N
Speed Kilometers Per Hour	0.1
Kilometers Per Hour = K	K
FAA mode indicator (NMEA 2.3 and later)	null field
Checksum	*62

TAIP Message Description

The TAIP data stream provided by the modem will be raw serial (ASCII) format and is always uppercase.

Examples of TAIP messages:

>RPV19277+3508570-0806260100002632;*75<

>RPV19282+3508571-0806260100000432;*7E<

>RPV19292+3508573-0806260300013832;*71<

>RPV19297+3508573-0806260400013432;*7F<

TABLE 4. Elements of a TAIP message

Elements	command portion Partie de com-mande
Begin Message:	>RVP
Seconds into the day (5 Bytes):	19277
Latitude in Degrees (8 Bytes):	+3508570
Longitude in Degrees (9 Bytes):	08062601
Speed in MPH (3 Bytes):	000
Heading in Degrees (3 Bytes):	026
Source of Data (1 Byte):	3
Age of Data (1 Byte):	2
Check Sum:	;*75
End Message:	<

APPENDIX C

Warranty

The following terms and conditions ("Warranty Terms") govern the warranty services offered to you ("Customer") by AIRLINK COMMUNICATIONS, INC. ("AirLink"), located at 3159 Corporate Place, Hayward, CA 94545, in connection with the sale and licensing of AirLink software and hardware.

Warranty Terms

Standard Software Warranty

AirLink warrants that the AirLink software ("Software") licensed hereunder will perform in substantial conformance to the applicable AirLink software specifications during the warranty period. The warranty period is ninety (90) days from the date of delivery of the Software to Customer. AirLink's sole obligation with respect to this express warranty shall be, at AirLink's option, to refund the license fee paid by Customer for any defective Software or to replace the Software with Software that substantially conforms to AirLink's applicable software specifications.

One Year Standard Equipment Warranty

For a period of one year from delivery, AirLink warrants that the hardware products ("Hardware") will meet AirLink's standard specifications and will be free from defects in materials and workmanship.

Optional Two Year Extended Equipment Warranty

If Customer has purchased this two-year extended warranty option, for a period of three years from delivery, AirLink warrants that the Hardware will meet AirLink's standard specifications and will be free from defects in materials and workmanship.

Optional Four Year Extended Equipment Warranty

If Customer has purchased this four-year extended warranty option, for a period of five years from delivery, AirLink warrants that the Hardware will meet AirLink's standard specifications and will be free from defects in materials and workmanship.

Warranty Conditions

Remedy

If under normal use the Software and/or Hardware (collectively, the "Products") prove to have any such defect and the Customer notifies AirLink of such defect within the warranty period, AirLink, at its option, will either repair or replace the same without charge. The warranty does not apply if the serial number label or any warranty voiding label has been removed or if the Product has been subjected to physical abuse, improper installation, or modification not authorized by AirLink, or if the Product was used in a manner for which it was not intended. Products will be accepted for repair or replacement upon written authorization and in accordance with instructions of AirLink. Customer will obtain a Return Material Authorization ("RMA") number from AirLink's Customer Support, fill out an RMA submission form, and enclose it with the product. Transportation expenses associated with returning such Products to AirLink will be borne by Customer. AirLink will pay the costs of return transportation of the repaired or replaced Products. Please contact AirLink's support group via email at support@airlink.com or telephone at 510-781-9760 to obtain an RMA number. Products deemed by AirLink to be DOA (dead on arrival) may be returned to AirLink for repair, at AirLink's expense, using the standard RMA procedures.

WARRANTY DISCLAIMER

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DIRECTLY GIVES RISE TO THE CLAIM. THIS CLAUSE WILL SURVIVE THE FAILURE OF ANY EXCLUSIVE REMEDY AND THE EXPIRATION OF THESE WARRANTY TERMS.

General Conditions

AirLink shall have the right to assign any or all components of these Warranty Terms without the prior written consent of the other party. AirLink shall not be liable to Customer for any alleged loss or damages resulting from delays in performance (including for AirLink, loss or damages resulting from delivery of the Products being delayed) caused by any act of God, fire, casualty, flood, war, failure of public utilities, injunction or any act, exercise, assertion or requirement of governmental authority, earthquake, labor strike, riot, accident, shortage, delay in transportation or any other cause beyond the reasonable control of AirLink, and if AirLink shall have used its best efforts to avoid such occurrence and minimize its duration and has given prompt written notice to Customer, then AirLink's performance shall be excused and the time for performance shall be extended for the period of delay or inability to perform due to such occurrence. All notices and demands of any kind which either party may be required or desire to serve upon the other under the terms of this Agreement shall be in writing and shall be served by personal service or by registered mail, postage prepaid, to AirLink (Att: VP/Operations) at the address set forth at the beginning of this Agreement, and to Customer, at the address provided by Customer to AirLink on the applicable purchase order. If any provision of these Warranty Terms shall be held to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall in no way be affected or impaired thereby. The laws of the State of California shall govern these Warranty Terms. These Warranty Terms constitute the entire agreement between the parties hereto pertaining to the subject matter hereof, and any and all written or oral agreements heretofore existing between the parties hereto are expressly canceled and/or superseded. These Warranty Terms shall prevail notwithstanding any variance with terms and conditions of any purchase order. Any modifications of these Warranty Terms must be in writing and signed by a duly authorized officer of both parties hereto.

APPENDIX F FAQ

Many of these questions and solutions in the following sections come from AirLink Support.



Caution: Solutions should only be performed if you are experiencing the specific problem indicated and have the specific modem model number indicated. Some solutions are very specific to model numbers due to differing internal hardware.

FAQ Topics

Power, Antennas, and Signal Strength . . . . . page 143
- What is RSSI? Why is the RSSI for my PinPoint negative?
- What is the Proper RF Coverage for my PinPoint?
- What Type of Antenna is Best for my PinPoint?
- What do I need to power my PinPoint ?
- Can I use a portable battery to power my PinPoint ?

The PinPoint's IP Addresses and Local Networking . . . . . page 145
- Why Can't I reach my PinPoint from the Internet? What is a Restricted or Private IP?
- What is the difference between Private and Public mode?
- How do I set up Private Mode? How do I connect to my PinPoint to my router or to Linux?

Security for the PinPoint . . . . . page 146
- Does EDGE/GPRS provide any security?
- If I change the password in my PinPoint and forget it later, can I still access the modem?

GPS Features. . . . . page 148
- Can I track vehicle speed with my PinPoint ?
- What can affect GPS accuracy?

Third Party Device and Application Support . . . . . page 149
- What is the COM1000?

Power, Antennas, and Signal Strength

What is RSSI? Why is the RSSI for my PinPoint negative?

RSSI (Received Signal Strength Indication) is a measurement of the strength or intensity, not necessarily the quality, of the received signal.

The RSSI is measured in dBm which is the power ratio in decibel (dB) of the measured power referenced to one milliwatt (mW). One milliwatt is zero, therefore less than a milliwatt, common and ideal for cellular communication, is expressed as a negative interger.

What is the Proper RF Coverage for my PinPoint?

The optimal range for AirLink modems is an RF Coverage (RSSI value) of -60 to -95. RF coverage between -95 to -105 DBm will often still register, however functionality at this range can be greatly reduced and registration can become difficult. Any devices with an RSSI below -105 DBm will likely fail to register on a regular basis.

When addressing RF coverage ensure the antenna choice is appropriate for the device and frequencies required.

What Type of Antenna is Best for my PinPoint?

Antennas for cellular communication are commonly omni-directional and either dual-band or multi-band. They come in a variety of shapes and mounting confirgurations to suit several different types of needs.

While AirLink does sell a limited selection of antennas and antenna accessories, these are by no means all that are available or usable with your PinPoint. There are several suppliers of cellular accessories with a much wider selection of antennas designed to cater to a broader variety of situations.

Antennas selected should not exceed a maximum gain of 5 dBi under standard installation configuration. In more complex installations (such as those requiring long lengths of cable and/or multiple connections), it's imperative that the installer follow maximum dBi gain guidelines in accordance with the FFC's, Industry Canada's, or your country's radio communications regulatory body's regulations.

Dual-band

For cellular communication, the PinPoint requires a dual band antenna supporting both 800 MHz and 1900 MHz (1.9 Ghz) bands.

Dipole

Dipole is a common antenna type connecting directly to the PinPoint and extending out in a single straight wire.

The short dipole antenna (also known as a “rubber duck”) is a good desktop, portable antenna for use in areas with good signal strength and low electrical interference.

Mounts

Antennas can be mounted in a variety of ways (magnet, permanent, suction to a window, sticky tape, etc) which can allow you to move the antenna away from the PinPoint with a coax cable between the modem and the antenna allowing the antenna to be placed in a more suitable location for proper cellular reception: outside of a metal cabinet, the trunk lid of a car, a window, etc. A mounted antenna can be placed in locations where the simple, short dipole antenna connected directly to the PinPoint may not perform at all.

Can I use a portable battery to power my PinPoint ?

It is possible to use a portable battery for your AirLink modem, however, you most likely need to make the connector from the battery to the modem yourself. The battery also needs to have enough power to be able to handle the power consumption of the modem.

You can contact AirLink Support for a guide on how to use your AirLink modem with a portable battery.

The PinPoint's IP Addresses and Local Networking

Why Can't I reach my PinPoint from the Internet? What is a Restricted or Private IP?

On Your Wireless Service Provider's network, for security reasons, some accounts set up to be restricted to communication only from other devices on their network, called a Restricted IP or a Private IP. If you had two modems on Your Wireless Service Provider's network, they could communicate, but your computer, not using Your Wireless Service Provider as an ISP can't. You could normally still access the Internet using your PinPoint's restricted or private IP because the modem would use a proxy or gateway on Your Wireless Service Provider's network.

However, if you need to be able to contact your PinPoint (or the devices behind it) directly, instead of a **Restricted IP** (also called **Private IP**, **Non-Routable IP**, or **Proxy APN**), you will need to contact Your Wireless Service Provider your cellular provider to get your account changed to an **Unrestricted IP** (also called **Public IP** or **Internet APN**).

Note: Customized APNs are generally private and non-routable.

What is the difference between Private and Public mode?

When your PinPoint is powered on, ALEOS, acting as a PPP client, negotiates a PPP session with Your Wireless Service Provider's network at the conclusion of which it is assigned an IP address by your cellular provider. How this address is further acted upon by the modem is determined by Private or Public Mode.

Public Mode (*HOSTPRIVMODE=0):

The IP address assigned by Your Wireless Service Provider is passed on to the devices connected to the modem.

If there is a computer or device connected to the serial port of your modem, there are actually two PPP sessions taking place. After your modem receives Your Wireless Service Provider assigned IP address, a second PPP session is established between your computer or device and the modem ultimately assigns that IP address to that computer or device connected to the serial port.

Private Mode (*HOSTPRIVMODE=1):

The IP address assigned by Your Wireless Service Provider is not the address that is assigned to the computer or device connected to the PinPoint's serial port during the PPP negotiation or DHCP IP assignment. Instead, the computer or device connected to the PinPoint on the serial port is assigned the IP address configured in *HOSTPRIVIP and uses the IP address configured in *HOSTPEERIP to communicate to the modem.



How do I set up Private Mode? How do I connect to my PinPoint to my router or to Linux?

Private Mode is at times preferred or required to provide network connectivity to a Linux device, routers, or other devices. Private mode will generally also work with any PC in an environment where there is a need for the PinPoint to be configured to work with an internal network.

There are four AT commands you will need to set in the modem. You can set them using Wireless Ace or a AT commands with a terminal connection (page 59). The examples shown are from Wireless Ace.

***HOSTPRIVMODE=1 -** Private Mode turned on.

HOSTPRIVIP=[IP address***]** - IP address assigned to computer or other end device connected directly to the modem (example, 192.168.1.8).

HOSTPEERIP=[IP address***]** - IP address assigned to modem for local, not cellular, communication (example, 192.168.1.9).

HOSTNETMASK=[subnet mask***]** - Subnet Mask setting (example, 255.255.255.0).

The IP addresses configured need to be appropriate for your network. For most internal networks, using the IP range of 192.168.x.x is generally preferred. The first three parts (called octets) need to be the same for all devices on the network (such as 192.168.1.x), but you can use any number from 0 to 254 for the last part if you use a subnet mask of 255.255.255.0 (fewer numbers are usable with different subnets). The last part for each IP address on the network needs to be different.

The *HOSTPRIVIP and the *HOSTPEERIP need to exist on same subnet, the easiest subnet to configure is 255.255.255.0 which allows for 255 IP addresses on the same subnet. Unless you understand the complexities of subnetting or you are instructed to use a different subnet by your Network Administrator, it is safe to use 255.255.255.0 with an internal 192.168.x.x network.

Unless you are instructed to use a different IP range and subnet by your Network Administrator, using the 192.168.1.x or 192.168.0.x range with a subnet mask of 255.255.255.0 is recommended.



Caution: If the IP address of the device or computer connected to the modem is different from the one configured in the modem as the *HOSTPEERIP, communications will fail. If the Subnet Mask is configured differently in the modem than on the computer or device to which it is connected, you may not be able to communicate between them.

Security for the PinPoint



Does EDGE/GPRS provide any security?

While the structure of the EDGE/GPRS network provides data security, it is still recommended you use a VPN for additional data communication security.

For specific information about the security of Your Wireless Service Provider's network, contact your cellular dealer directly.

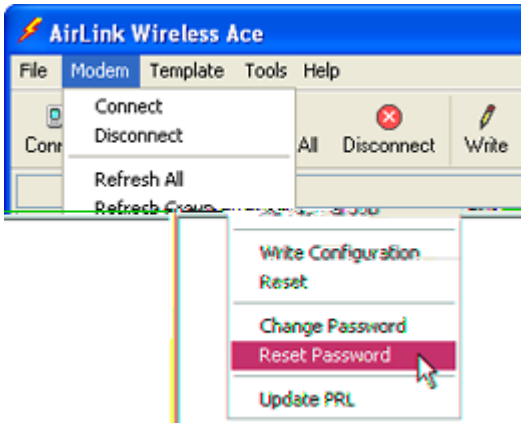
If I change the password in my PinPoint and forget it later, can I still access the modem?

If you changed your password from the default, you can have your password reset by calling or emailing AirLink's technical support.

The support technician will ask you for a **Challenge Code** which you can obtain using Wireless Ace. You will be asked to send this information in an email to support@airlink.com along with your name and company. Password resets are tracked.

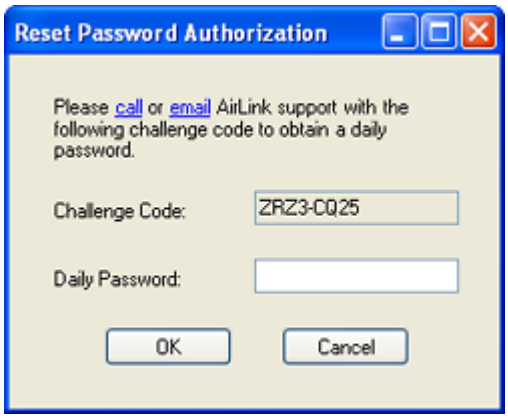
1. Start Wireless ACE: *Start > All Programs > AirLink Communications > Wirelss ACE 3G > Wireless ACE 3G*
2. Select *Modem > Reset Password*.

FIGURE 1. Wireless Ace: Reset Password



3. Note the Challenge Code shown (will be different than this screenshot).

FIGURE 2. **Wireless Ace: Challenge Code**



4. Enter the **Daily Password** provided by the AirLink support technician.

Note: The Daily Password will only work for the modem you requested, the copy of Wireless Ace you used to obtain the Challenge Code, and only for the specific time (approximately 24 hours).

GPS Features

Can I track vehicle speed with my PinPoint ?

The vehicle speed is based on the accuracy of each GPS recorded point which can be off by 10 meters in any direction. What you want to look for is a trend. If a point veers off suddenly in a random direction (i.e. off the road), then it's probably not valid. If you have a sudden low or high speed reading, then this may point to an inaccurate speed reading. Otherwise, if you see consistent acceleration and deceleration, it's probably accurate.

What can affect GPS accuracy?

GPS has many variables which can affect it’s accuracy:

- Are you getting a full view of the sky from the vehicle or antenna location?
- Do you have tall buildings or trees around?
- Is the weather cloudy?
- Other factors may contribute to inaccurate GPS.

Third Party Device and Application Support



What is the COM1000?

The COM1000 is a stand-alone 3rd party device that can be used with your PinPoint. There are AT commands for your PinPoint which take advantage of some of the properties of the COM1000. The COM1000 is made by SimpleComTools: http://www.simplecomtools.com/com1000.html and used in conjunction with AirLink modems: http://www.simplecomtools.com/wireless.html.

From SimpleComTools description of the COM1000:

> "The COM1000 provides you with a single device that can be seamlessly integrated into LAN, WAN, and WIRELESS projects. Its embedded applications provide quick and easy means of connecting serial devices to IP networks, Internet enabling legacy devices, or integrating remote devices with today's advanced 3G wireless data networks. Its unique blend of Serial and TCP/IP communications, digital and analog inputs, relays, and embedded applications combine to help simplify application integration and elimintate many of today's Machine-to-machine deployment challenges."

AirLink Technical Support

If you encounter problems with operation of your PinPoint, AirLink's support staff can help.

AirLink Support Web Site

The AirLink web site is updated frequently with Setup Wizards, Utilities, How-To Guides, and other documentation: http://www.airlink.com/support.

AirLink Documentation and Guides

- **User Guides** - These guides are specific to your modem type, cellular provider, and cellular technology and contain comprehensive information about the operation of the modem and its features.
- **Quick Start guides** - These guides are also specific to the modem type, cellular provider, and cellular technology and are a step by step guide to activating the modem using the Setup Wizard or other steps as applicable.
- **Utility Guides** - These guides focus on the features of one of the AirLink modem utilities: Wireless Ace, AceView, AceNet, Modem Doctor, etc.
- **Application Notes** and **How-To Guides** - These guides detail configuring the modem to work with a specific feature set or how the modem can be set up to work with a specific 3rd party (non-AirLink) device.
- **Data Sheets** and **White Papers** - These are technology based information documents.

Contacting Technical Support

For support assistance please email support@airlink.com or call 510-781-9760 Monday through Friday 5 AM to 5 PM Pacific Time (8 AM to 8 PM Eastern Time). Support is not available weekends or holidays.